the OIL AND GAS JOURNAL

Easy ON THE EYES!*

NEW BJ "Red Top" TONG DIES

*Chip-proof ends guard against eye accidents

ONLY THE TEETH

are hard...new BJ RED TOP dies are induction hardened *on the teeth* for sure grip and extra long wear... the rest of the die remains resilient to resist shock and chipping.

Have you seen the new Miss BJ 'Red Top' Calendar?

ASK YOUR BJ FIELD REPRESENTATIVE

the New U-35

DESIGNED TO FILL THE NEED FOR A *COMPACT, EFFICIENT* RIG FOR DRILLING FROM 2,500′ TO 5,500′

UNIT RIG now has available a draw works for every depth. The NEW MODEL U-35 is made in both single and double drum units, and is designed for 200 to 400 input horsepower. Tests in the field have proved it to be fast, rugged, efficient and economical for drilling to 5,500′ or for servicing the deepest wells.

Ask your supply store, or write direct to factory for the new U-35 catalog.

WRITE FOR NEW CATALOG

UNIT RIG & EQUIPMENT CO.
TULSA, OKLAHOMA U.S.A.

DESIGNED FOR THE JOB...

UR-524

UNIT RIG DRAWWORKS ARE SOLD EXCLUSIVELY THROUGH THESE AUTHORIZED DISTRIBUTORS IN THE U.S.A. AND CANADA

BOVAIRD SUPPLY COMPANY
HOUSTON OIL FIELD MATERIAL COMPANY
HOWARD SUPPLY COMPANY
IVERSON SUPPLY COMPANY
JONES & LAUGHLIN SUPPLY COMPANY
LUCEY PRODUCTS CORPORATION
MID-CONTINENT SUPPLY COMPANY
NORVELL-WILDER SUPPLY COMPANY
OIL WELL SUPPLY COMPANY

EXPORT SALES — MIDCONTINENT SUPPLY COMPANY, 42 Broadway, New York City. Cable— MIDUNITRIG

THE OIL AND GAS
JOURNAL

Vol. 51, No. 42

NEXT WEEK

- Extreme Flexibility Features Operation of Sohio's Plants.
- Lea County, New Mexico, Leads Permian Basin Activity.
- Journal Report: Synthetic Lubricants.
- The Percentage-of-Thinning Chart.
- Marginal Field Transformed Into Flowing.
- Geologic and Engineering Aspects of Continental Shelves.
- Good Field Limestone Reef Production.
- Other Articles and Regular Features.

REGULAR DEPARTMENTS

They Say	104
Calendar of Events	107
Journally Speaking	113
Editorial	115
This Week	117
Watching Washington	120
International News	133
Personals	137
Deaths in the Industry	139
Books	158
On the Job	189
Engineering Reference	197
Refiner's Notebook	199
Engineering Fundamentals	201
Heat Transfer	203
Modern Drilling	205
Corrosion Control	207
Pipe-Line Construction	208
Pipe-Line News	221
Drilling Contractors	224
Active Rotary Rigs	226
Refining News	229
Natural-Gas News	231
Natural-Gasoline News	231
Exploration Statistics	252
Production Statistics	253
Refining Statistics	254
Market Statistics	255
Equipment Men in News	256
Classified Advertising	259
Advertisers' Index	263

EXPLORATION—DEVELOPMENT

Nebraska's Salina Basin	233
Highlights of Week	233
Reports by Areas	234
Summary of Completions	251

CONTENTS FOR FEBRUARY 23, 1953

NEWS FEATURES

OPS Lifts Controls on Crude, Products, Oil-Field Equipment, and Services	118
Truman Order Merely Shifted Tidelands From Interior to Navy, Brownell Says	119
Readoption of Venezuelan Agreement Hinges on Imports Rate, Brown Says	120
PAD Says Drilling Will Not Exceed 50,000 Wells in Next 3 Years	121
Ten Gas-Line Projects Split 140,425 Tons of Second-Quarter Line Pipe	122
FPC Now Permitting Gas-Price Evidence in Hearings Before Examiners	123
Pollution Problem Getting Worse, But Industry Must Solve It, W.P.R.A. Told	123
Crude-Oil Prices Increased by Companies in Pennsylvania, California	124
Deeper Pay Discovery Makes Important Field of California's Guadalupe	125
Prospects for Water Flooding in California Outlined Before A.I.M.E.	126
Wildcatters Complete 1,008 Tests in January, Biggest Month Since October	127
Eugene Holman, Morris Muskat Receive A.I.M.E. Medals at Annual Meeting	128
Texas Cuts Allowable Because of High Stocks, High Rate of Imports	131
World Production Steady in December With Little Change From January	133
Italian Tanker Docks in Genoa; Cargo Impounded Quickly by Court Order	134
Russia Says Oil Plan Being Fulfilled, but Some Areas Are Lagging	135

ENGINEERING-OPERATING FEATURES

Portable Submersible Tank-Battery Barge Withstands Severest Weather 141
Storms, wind, and waves are taken in stride by this tank, operated by Sunray Oil Co. By C. E. McClatchey.

Petrochem Report: How to Make Phenol 146
Four processes are available to make this valuable basic aromatic chemical. Each is described. By John M. Weiss.

Journal Check Chart: Identify this Instrument 155
This is another in a series of puzzle pictures, in which the reader can test his knowledge of oil-field equipment.

Logging Dry Shot Holes 156
A description of a simple, cheap technique for logging shot holes drilled without water. By Thomas S. Hargest.

Cat Cracker Gas Plant Expanded to Accommodate New Unit 161
Union Oil utilizes excess gas-plant capacity to process gas from new F.C.C. process. By Arnold E. Kelley and Harry F. Poll.

Engineering Factors in Heater-Treater Selection 170

Engine Cooling By Ebullition 172
Here are told the advantages of engine cooling by heat transfer to boiling water over the usual method. By O. B. Freeman.

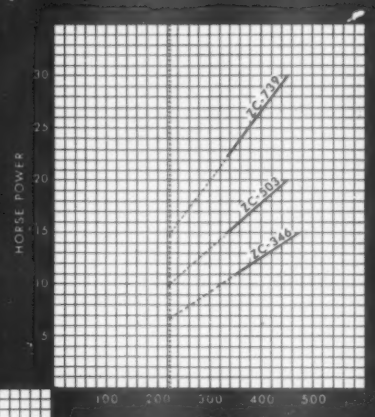
Exploration Activity in the Southeastern States 183
Favorable geologic conditions and recent oil-field successes indicate a continuance of field development in the deep South. By R. E. Baum.

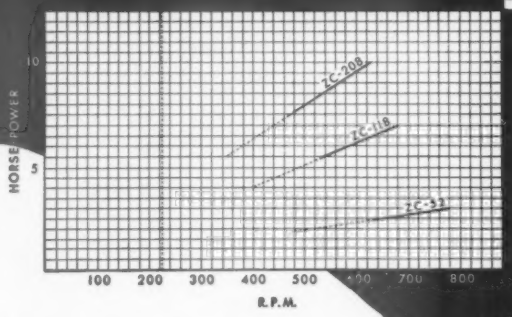
On the Job . . . In the Plants 189
Foam for use in fighting refinery fires is sped to scene by specially equipped trucks.

On the Job . . . In the Fields 194
Standardized traps are designed to meet characteristics of pumping wells in Wilmington field.

Engineering Reference Section 197-207

choose it on these charts...





RATED HP. CURVES FOR CONTINUOUS HEAVY DUTY SERVICE

(Gas or Gasoline)

Recommended continuous hp. for each size engine is shown by the combined dotted and solid graph line which represents the governed engine speed range for continuous service.

Hp. ratings are for heavy-duty continuous service. Maximum hp. ratings are not shown. Highest speed shown for each size is for heavy-duty pumping service, and in every instance is less than 900 f.p.m. piston speed.

To realize the full advantages of ample flywheel effect, it is best to select the engine to operate at the higher speeds indicated by the solid graph line.

Engine should not operate at speeds less than 225 r.p.m., as limited by magneto impulse coupling.

...and be right!

When you choose a Fairbanks-Morse "ZC" Engine for your pumpers, you're not guessing about horsepower ratings. For "ZC" engines are *not* rated by maximum horsepower . . . they *are* rated by horsepower for *continuous heavy-duty service.*

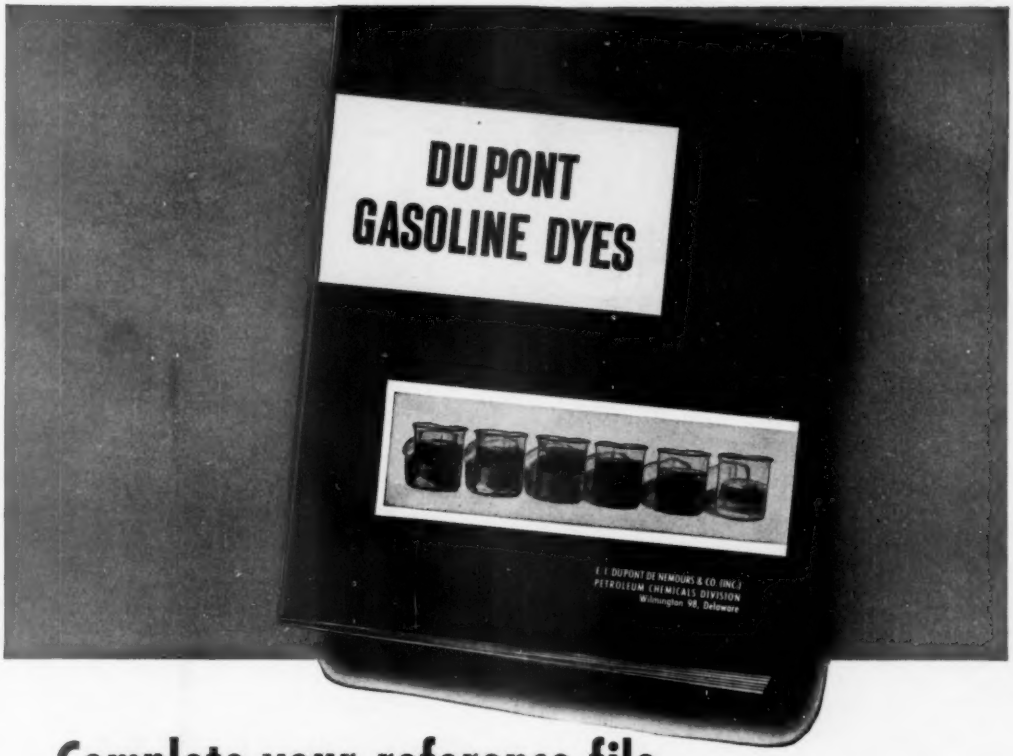
Fairbanks-Morse conservative ratings give you the data from which you can select with safety, knowing that there is an ample reserve to meet the momentary peak loadings you will encounter.

For the complete story on the "ZC" . . . the engine with the *big double wheels* . . . see your local supply store or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering

OIL FIELD EQUIPMENT • PUMPS • SCALES • ELECTRIC MOTORS • GENERATORS • LIGHT PLANTS • DIESEL, DUAL FUEL AND GASOLINE ENGINES • MAGNETOS • DIESEL LOCOMOTIVES



Complete your reference file on gasoline dyes with this helpful booklet

The use of gasoline dyes has always presented a number of handling and addition problems. Now, all the information a refiner needs to have about coloring gasoline is available in one compact booklet.

The latest methods of dyeing gasoline are fully discussed. It explains in detail the dry dye eductor system as well as the various other methods of addition by dye pot.

The booklet also gives complete information on all Du Pont gasoline dyes—including solubility charts and spectrophotometer curves. And it contains much helpful information on handling dyes; such as how to remove dye stains from clothing and equipment plus useful shipping information.

In order to have this booklet on file for ready reference, ask now for a copy of "Du Pont Gasoline Dyes." Address your request to the nearest Du Pont Petroleum Chemicals Division district office.

DU PONT
REG. U.S. PAT. OFF.
Better Things for Better Living
. . . through Chemistry

Petroleum Chemicals

E. I. DU PONT DE NEMOURS & COMPANY (INC.)
Petroleum Chemicals Division • Wilmington 98, Delaware

District Offices: New York, N. Y. · Chicago, Ill. · Tulsa, Okla. · Houston, Texas · Los Angeles, Calif.

District Laboratories: Wilmington, Del. · Chicago, Ill. · Tulsa, Okla. · Houston, Texas · El Monte, Calif.

IN CANADA: Canadian Industries Limited—Toronto, Ont.—Montreal, Que.—Calgary, Alta.

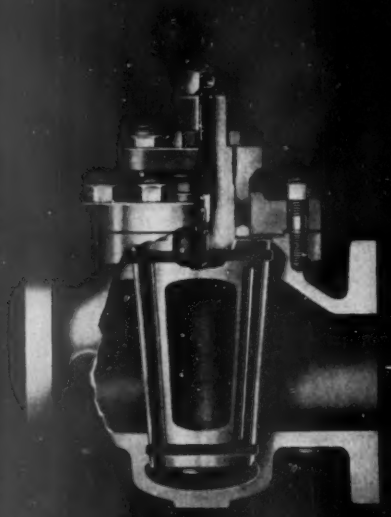
The Oil and Gas Journal, published Mondays, copyright 1953, by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $4 yearly.

"The United States never lost a war or won a conference."
—Will Rogers (1879-1935)

AMERICAN PUMPING UNITS ARE GREAT for getting maximum production with a minimum of power consumption, because they are engineered with more than a dozen field-proven features that reduce friction and provide extra years of trouble-free service. AMERICAN structures and reducers conform to A.P.I. Specifications. Write for Catalog 151 describing the complete range of sizes. Contact your favorite supply store or the nearest American office.

AMERICAN
MANUFACTURING COMPANY OF TEXAS
FORT WORTH 11, TEXAS

Branch Offices: HOUSTON—KILGORE—ODESSA—TULSA



LUBRICATED PLUG

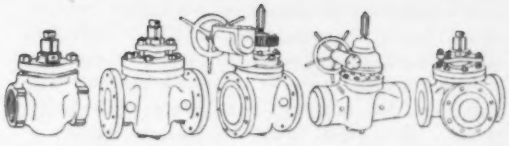
COMPLETE LINES OF LUBRICATED PLUG VALVES

Because of the wide range of services to which Lubricated Plug Valves can be adapted, they may be classed as "all-purpose" valves. Walworth manufactures complete lines of Lubricated Plug Valves in a variety of types and materials for working pressures up to 5,000 psi and for vacuum services. Sizes range from ½ to 30 inches. Write for descriptive literature.

Walworth also manufactures complete lines of gate, globe, angle, and check valves made of steel, bronze, iron, and special alloys.

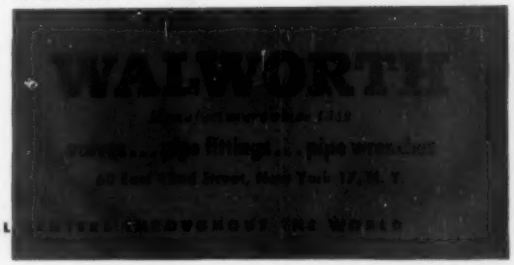
Walworth valves, pipe fittings, and pipe wrenches total approximately 50,000 items and are sold through distributors all over the world.

Walworth engineers will be glad to help you with your problems. Call your local Walworth distributor, nearest Walworth sales office, or write to our General Offices, 60 East 42nd Street, New York 17, New York.



Illustrated in section is a Walworth No. 1700F Regular Gland Type, Wrench Operated, Steeliron, Lubricated Plug Valve. This particular line of valves has a working pressure rating of 200 psi at 150F or 125 psi at 450F. Sizes range from ½ to 8 inches. Other Walworth Lubricated Plug Valves include Single Gland and Ball Bearing types. They are available for a variety of working pressures.

For best results use Walworth Lubricants and Walworth High Pressure Lubricant Guns.



DISTRIBUTORS IN PRINCIPAL

Spray away your CLEANING PROBLEMS with the FIRST

universal cleaner*

no heat, no odor, no fumes, no solvents, no skin-burns, *It's* FIRE PROOF!

Developed for *all* American Industry...an amazing super-cleaner you *spray* on! Just touch the trigger of this remarkable pressure gun and the world's first Universal Cleaner...Patented KELITE SPRAY WHITE... goes to work cleaning practically anything, anywhere ...with complete safety. It removes grease, oil, wax, gum, dirt, dye, ink, soap, light carbon, etc....does it without heat, odor, fumes, solvents, fire-hazard, or danger to skin. Does it NOW—in seconds! And it's completely safe on all metals, plastics, rubber, porcelain, composition, concrete or wood when used according to directions. You simply must see it work to believe it! Sturdy gun refills in seconds—holds enough SPRAY WHITE for hours of cleaning...is charged with air pressure from any source...comes complete with spray and needle-jet nozzles. Built to last a life-time of HARD industrial use.

* KELITE SPRAY WHITE, U. S. Patent Number 2,381,124

SEE A DEMONSTRATION TODAY! Telephone your local Kelite service office or write to the address below

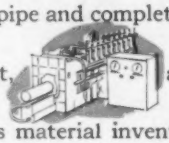
KELITE
REG. U. S. PAT. OFF.
PRODUCTS, INC.

1250 No. Main St., Los Angeles 12, Calif.

Service Offices in 99 Principal American Cities

Your WATCHDOG COMMITTEE on COSTS will approve

SHOP FABRICATION OF PIPING

because . . . both quality and economy are guaranteed. Piping is fabricated in Grinnell shops under ideal conditions, with modern equipment, by personnel qualified in all classes of work. Price (determined in advance) includes competent engineering, scheduling and shop sketches, efficient material procurement. Grinnell supplies heat, light, power, water, compressed air, expendable tools and supplies. Grinnell shops have large storage areas for pipe and completed assemblies, expensive modern equipment,  a permanent staff of skilled workers. Grinnell finances material inventories and payrolls; carries insurance. The customer pays for no waste material or spoilage. Shop fabricated piping is rigidly inspected and tested to meet exacting requirements of customer's specifications and applicable codes. It is cleaned inside and outside and painted. Squared to standard dimensional tolerances, sub-assemblies are erected at the job site more quickly and easily. It all adds up to this . . . shop fabrication by Grinnell guarantees quality and economy.

Write for complete facts.

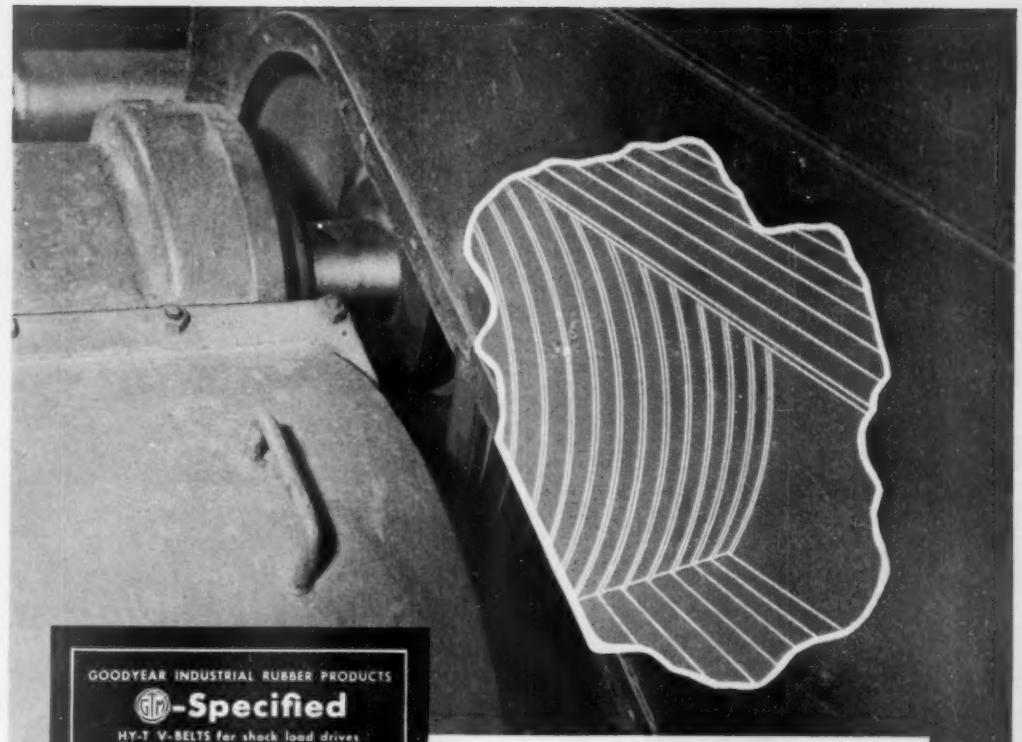
GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves • Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies • industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

MECHANICALLY
CONTROLLED
ARC WELDING
ONE of many controlled steps
to qualify in AMERICAN IRON
AMWELD
TRADE MARK REG.
(counterbore weld)
TOOL JOINTS
As shown above, AMWELD Tool Joints are welded to drill pipe by a submerged arc — the finest mechanically controlled arc welding process known. The mechanically fed rod, plus the continuous flowing flux covering all flash, assures smooth, even welds free from foreign elements. The drill pipe, with tool joint bucked on, is held at an 80° angle and mechanically rotated during the welding process.
AMWELD Tool Joints are for operators who prefer regular A.P.I. Joints welded on their drill pipe (and welded on to hold)! AMWELD is the registered trade name for American Iron's superior design and method used in welding these widely used tool joints.
District Office — Houston, Texas
AMERICAN IRON & MACHINE WORKS CO.
MANUFACTURERS OF
A
OIL FIELD EQUIPMENT
REG. U.S. PAT. OFF.
OKLAHOMA CITY U.S.A.



GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GM-Specified
HY-T V-BELTS for shock load drives
A
B
C
A Oil-resistant, wear-resistant cover stock
B Multi-plies of synthetic fiber with high tensile and low elongation to handle shock loads and stresses
C Cushion-section of high-quality fabric reinforced rubber

SERVED 8,520 HOURS—

double ordinary V-Belt Service

MATCHED set of eleven Hy-T V-Belts by Goodyear installed on oil field pump delivered 8,520 hours' service after specification for drive by G.T.M. —Goodyear Technical Man.

Ordinary V-Belts on adjoining similar drive failed in ½ the time. Comparison shows added belt life of Hy-T Belts, thanks to special design featuring synthetic material in reinforcement for high strength and low stretch. Write Goodyear, Mechanical Goods Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing, Tank Lining, Rubber-Covered Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

Hy-T—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

Call on Cyanamid for your chemical requirements...

from oil well to oil can

Gelling Agents

Specialty Catalysts

Technical Service

AEROCAT® MS Synthetic Fluid Cracking Catalysts

Drilling Mud Compounds

AEROLUBE® Additives

Cyanamid service to the Petroleum Industry is characterized by its ability, based on research, to meet the chemical requirements of the many distinct phases of that industry. Products of the Petroleum Chemicals Department range in application from drilling and refining to additives for lube oils and gelling agents for greases.

With specialists in each phase of production and refining, this integrated department is able to direct its product development work toward the solution of problems affecting the petroleum industry's flow-line from well to consumer.

Field experience bears this out: in one major oil-producing area, for example, 75% of the wells drilled over 6,000 feet have successfully employed Cyanamid's AEROPAN® SR-1 Drilling Mud Compounds.

AMERICAN Cyanamid COMPANY

PETROLEUM CHEMICALS DEPARTMENT, DIV. OG2
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto and Montreal

SAVE 5 WAYS on Pipe Threads

- FEWER MACHINES
- LOWER TOOL COST
- LOWER TOOL INVENTORY
- LESS SET-UP TIME
- HIGHER PRODUCTION

In tightening markets, Landis Pipe Threading Machines offer wide-open opportunities to cut production costs of pipe threads.

Three sizes of Pipe Machines will handle all diameters of pipe from 1/4" to 18". Each die head is constructed to handle a wide range of pipe sizes —for example the 6" machine will thread all diameters from 1" to 6". Universal size adjustment allows quick set-up. Thus, a few machines will handle the complete range.

Die heads employ Landis Tangential Pipe Chasers. Interchangeability of the chasers further increases the versatility of these machines. The same chasers may be used for all diameters of threads within the range of a given die head providing that the pitch, form, and taper remain the same, thus reducing tool inventory. Chasers need be replaced only one at a time as needed. Chasers last longer since 80% of their length may be reground as the cutting edge dulls. Line contact with the work reduces friction and chaser wear, allows use of higher cutting speeds, and reduces chaser breakage.

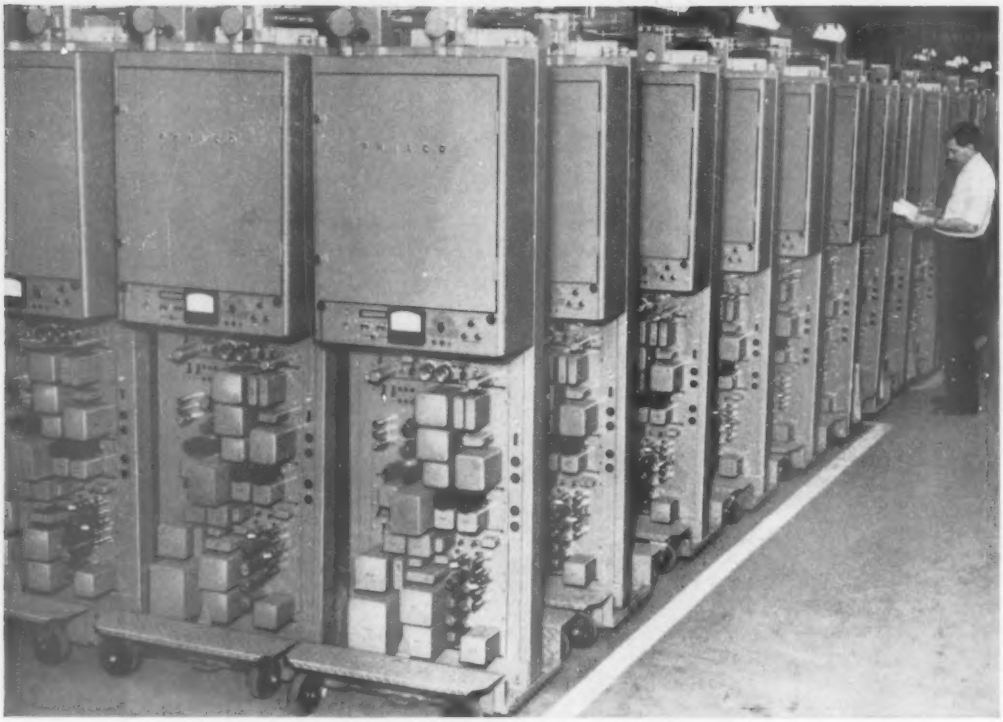
A separate type of machine, the Receding Chaser Pipe Machine, is especially designed to handle A.P.I. Tapered Pipe Threads. Chasers recede into the head at a rate equal to the taper of the thread, ensuring accurate and uniform taper along the full thread length. This mechanism allows the use of smaller chasers, lowering tool cost and dollar tool inventories. Leave-off marks are eliminated by this receding action.

Investigate how Landis Pipe Machines can reduce direct tool cost, increase daily production, and reduce investment in tool inventory and heavy machinery. Write for specifications and further information.

LANDIS Machine COMPANY
WAYNESBORO PENNA., U.S.A.

50TH ANNIVERSARY

Represented in the Domestic Oil Fields by: Colcord-Wright Machinery & Supply Co., St. Louis, Mo.; C. J. Harter Machinery, Houston, Texas; Frederic-Baker Co., New Orleans, La.; Moore Machinery Co., Los Angeles and San Francisco, Calif.; Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.



PHILCO IS THE WORLD'S LEADING MANUFACTURER OF MICROWAVE EQUIPMENT

Philco leads the world in mass production of quality microwave equipment to meet modern industry's demands for relay systems of the highest reliability and performance.

Philco microwave components meet most JAN (Joint Army-Navy) specifications without any changes in circuitry, thereby permitting other users of microwave communications equipment to have the built-in reliability required by the Armed Forces. That is why commercial users of Philco microwave equipment include such famous names as American Telephone & Telegraph Co., Santa Fe Railway System, Bonneville Power Administration, Platte Pipeline Company and many others.

Where quality and reliability are important, look to Philco . . . world's leading manufacturer of microwave equipment!

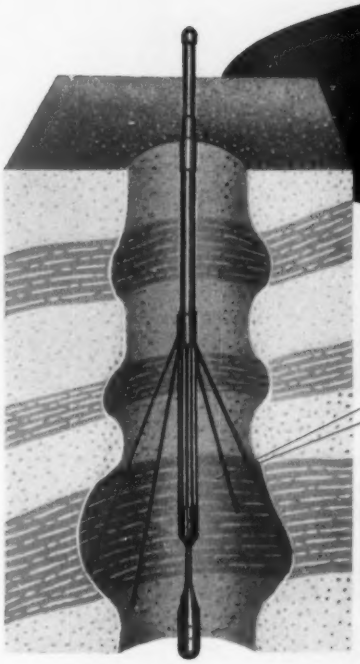
For complete information write to Department OG

PHILCO Famous for QUALITY the World Over

PHILCO CORPORATION

GOVERNMENT & INDUSTRIAL DIVISION

PHILADELPHIA 44, PA.



proved best to provide most accurate profile...

HALLIBURTON ELECTRIC CALIPERS

Prevent errors of guesswork with a top-to-bottom "picture" of the open hole. You can accurately "see" your well through the eyes of the Halliburton Electric Caliper – get vital information for successful cementing, acidizing, gravel packing, and other critical operations.

Since each formation reacts differently to the action of drilling fluid, bits and drill pipes, open hole calipering is the only way to know your well's diameter profile. As the originator and leader in the field of electric calipers, Halliburton equipment has been proved best to provide the most accurate and useful record of your well.

The versatile Halliburton Electric Caliper is best known as an accurate aid in determining the capacity of the portion of the hole to be cemented, but it is also a valuable fact-finder for other important cementing jobs. A caliper log is often the best or only way of locating tight spots to be reamed, centering pipe guides and stabilizers, locating the top of cement columns, and determining the exact amount of materials for a plugging back job.

As a guide in acidizing, the Halliburton Electric Caliper reveals the amount of acid required and the effects of this exacting operation. The presence of ledges and amount of gravel needed for packing can easily be determined, and fishing can be completed with minimum delay. The application of caliper log data to packer setting, well shooting, side wall coring, casing perforating, and casing salvage makes the low cost of the Halliburton Electric Caliper a most valuable investment.

Always call for Halliburton to provide the accurate picture of hole profile. Your nearby Halliburton representative has interesting data available on the newly developed uses for caliper logs. Remember that Halliburton's Electric Caliper was used *first* . . . and is still used *most!* Halliburton Oil Well Cementing Company, Duncan, Oklahoma.

HALLIBURTON

YEARS AHEAD IN ELECTRICAL WELL SERVICES!

Hundreds of feet of Bethlehem Oil and Gas Pipe stored at the job site, ready to be trucked to the trench.

Bethlehem Pipe is easy to handle. Its 40-ft lengths mean rapid installation, fewer joints per mile.

29,000-ft Steel Gas Line Installed in Indiana

Welding team applies finishing touches to a circumferential weld. Bethlehem Pipe can be welded economically in the field.

Hammond, Ind., was the scene of the recent pipeline construction shown in these photographs. The job involved the installation of a steel line, 29,000 ft long, for the Northern Indiana Public Service Company. The pipe selected was 36 in. x 7/8 in. Bethlehem Gas Pipe, made to Specification API5LX. It was furnished in 40-ft lengths.

Bethlehem Oil and Gas Pipe is the ideal pipe for distribution-line service. It is sound, leak-proof, uniformly coated with coal-tar enamel, and easy to install. It is usually made to ASTM Specifications API5LX, A134 or A242-50T (Mayari R).

Bethlehem Oil and Gas Pipe is regularly furnished in 40-ft lengths. It is made from plate steel, and comes with beveled or straight ends, in all diameters from 22 in. i.d. In diameters up to 36 in., the pipe has one longitudinal seam and one girth seam. Larger sizes have two longitudinal seams.

Bethlehem is equipped to handle virtually every phase of pipe-making, including grit-blasting, priming, enameling and wrapping, and the manufacture of tees, crosses, and other types of fittings.

If you would like to have additional information about Bethlehem Oil and Gas Pipe, please get in touch with the nearest Bethlehem office.

When severe vibration is encountered, use pipe made of Mayari R, Bethlehem's low-alloy, high-strength steel. Mayari R resists vibration because of its excellent resistance to fatigue or repeated stresses. Besides, it has a yield point of 50,000 psi min, and an endurance limit of 50,000 psi.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

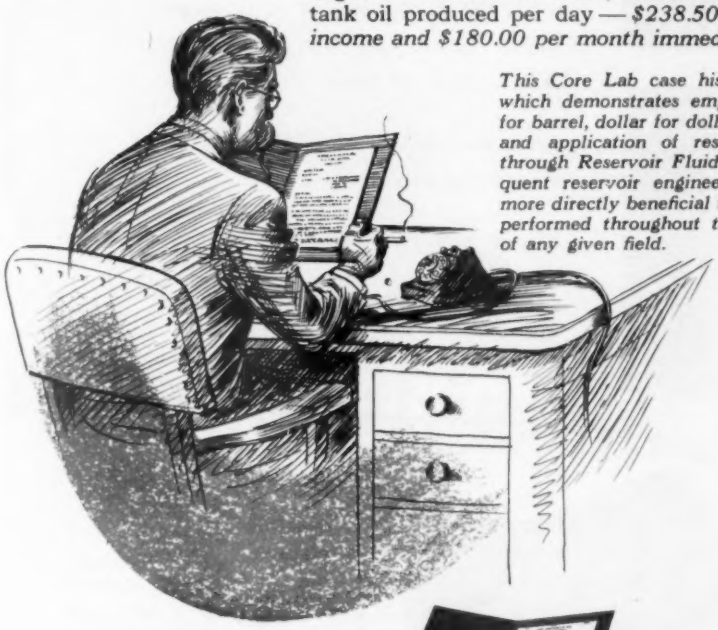
BETHLEHEM STEEL

BETHLEHEM OIL AND GAS PIPE

He made this new discovery without drilling a single well...

Shrinkage factor data presented in a Core Lab *Reservoir Fluid Analysis Report* indicated that, after separator pressure was increased from 35 psig to 110 psig, about 3 percent more stock tank oil was recovered per unit volume of reservoir oil produced; and that stock tank oil gravity was increased from slightly less than 38 degrees API to over 40 degrees API. The net result, based on 100 barrels of stock tank oil produced per day — *$238.50 per month deferred income and $180.00 per month immediate income.*

This Core Lab case history is one of many which demonstrates emphatically that barrel for barrel, dollar for dollar, the comprehension and application of reservoir data obtained through Reservoir Fluid Analysis (and subsequent reservoir engineering studies) can be more directly beneficial than any other service performed throughout the productive history of any given field.



If it's worth producing it's worth producing right!

Ask your Core Lab man today about Reservoir Fluid Analysis!

CORE LABORATORIES, INC. ● **IN ALL ACTIVE AREAS**

Dallas, Houston, Corpus Christi, Midland, Abilene, San Antonio, Tyler, Wichita Falls, Lubbock, Oklahoma City, Ft. Worth, Great Bend, Shreveport, Lafayette, New Orleans, Natchez, Bakersfield, Denver, Sterling, Worland, Williston, Billings, El Dorado, Farmington, Lovington, Calgary, Edmonton, Venezuela, S. A.

CORE LAB

PETROLEUM RESERVOIR ENGINEERING

J&L STEEL

SHOT HOLE CASING

Faster, more convenient, more economical for seismograph crews

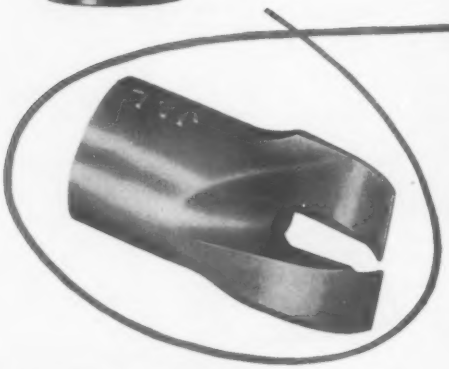
In most formations you can drill with the casing. It has high torsional strength.

It is light, easy to handle. 3" O.D. weighs only 2.037 lbs. per foot. 4" O.D. weighs only 2.732 lbs. per foot. Furnished in uniform 10' to 20' joints.

Rolled threads with 15,000 lbs. pull out strength average.

Integral joint; no independent couplings.

Available quickly, anywhere. 'Phone your J&L store.



This inexpensive, expendable bit has threads to match the casing. Large water course. Fast-cutting fishtails. Drilling and setting in one operation saves time and money where formations are favorable.

PESA

JONES & LAUGHLIN STEEL CORPORATION
SUPPLY DIVISION

J&L STEEL

General Offices: **TULSA, OKLAHOMA**

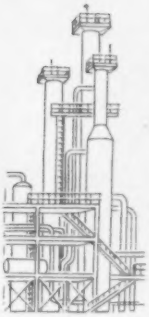
88 STORES • 19 OFFICES • 9 RESIDENT SALESMEN

EXPORT: 405 Lexington Ave., New York, N. Y., U. S. A.

buying chemicals

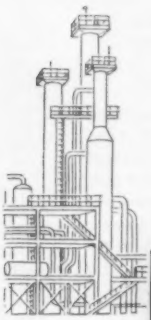
Of all the process industries, petroleum refining is one of the largest consumers of chemicals . . . in both number and quantity. So, when buying chemicals, refiners rate a dependable source of supply second only to quality.

to better advantage



Mathieson measures up to the requirements of a great many petroleum refiners. Thirteen plants, all producing essential raw materials for petroleum refining, assure maximum dependability. Mathieson is known and recognized for quality . . . and has been for over 60 years. But an added advantage is Mathieson's basic production of many chemicals needed for petroleum refining —caustic soda, sulphuric acid, soda ash, ammonia, sulphur, carbonic gas, chlorine, sodium nitrate and sodium chlorite.

from Mathieson



These same advantages will be of benefit to you. You'll be sure of top-quality chemicals . . . multi-plant production facilities provide dependability . . . integrated delivery system assures on-time schedules. You'll find you can buy chemicals to better advantage—at any time —by consulting with Mathieson.

MATHIESON

MATHIESON INDUSTRIAL CHEMICALS COMPANY

Division of Mathieson Chemical Corporation

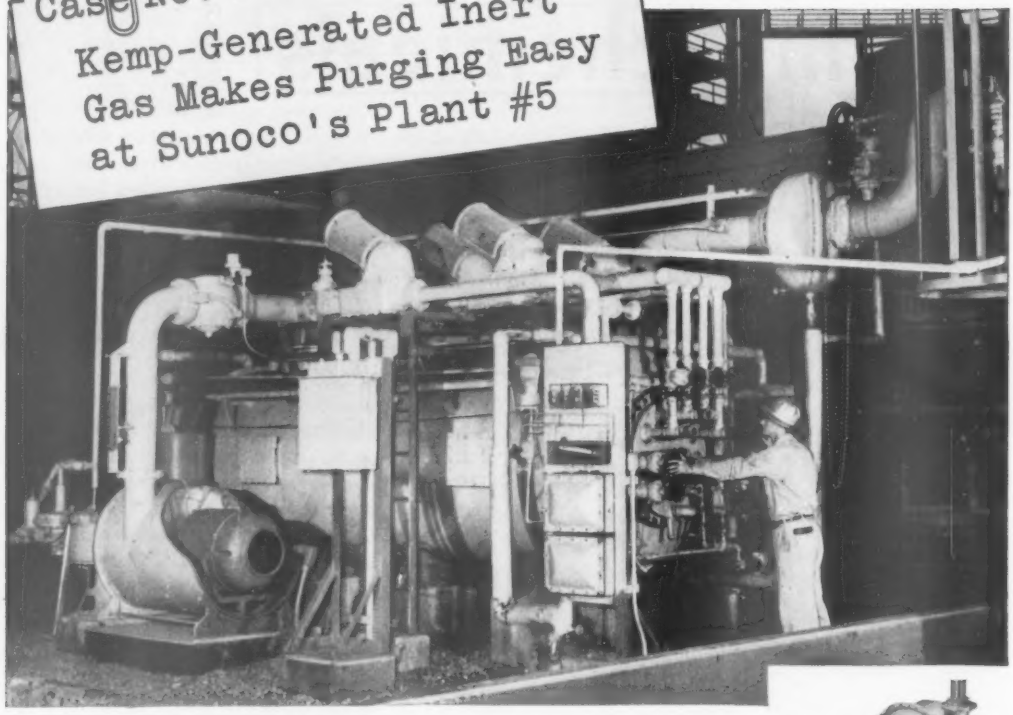
BALTIMORE 3, MARYLAND

1523

caustic soda • soda ash • liquid chlorine • sulphur • sulphuric acid • bicarbonate of soda • ammonia • sodium nitrate • nitric acid • hydrazine sodium methylate • sodium chlorite • hypochlorite products • dry ice and carbonic gas • ammonium sulphate • ethylene derivatives • methanol

Case No. 57

Kemp-Generated Inert Gas Makes Purging Easy at Sunoco's Plant #5



How Sun Oil's "Magic Mill" at Toledo operates with 'round the clock safety

There's no *one* word that strikes terror in the hearts of oilmen everywhere more quickly than F-I-R-E! To combat this threat at the Sun Oil Co.'s giant refinery at Toledo, Ohio, constant vigilance, checks and inspections are the answer. And the liberal use of inert gas for purging pipelines, tanks and crackers is essential to this safety maintenance.

Kemp selected to do the job

When plans called for *doubling* plant production in 1950, a new Kemp Generator (see above) was installed to insure adequate inert gas production. Fast-starting, easy-to-operate, this Kemp unit more than filled the bill. Today tanks and lines are periodically purged for inspection and cleaning *as often as needed*. And thanks to its 60,000 cu. ft. per hr. Kemp Inert Gas Generator, Sunoco enjoys *exact analysis* inert production that meets all its purging requirements.

Let Kemp help you, too

If you have a purging or blanketing problem, why not let Kemp Engineers give you the same helpful advice used so profitably at Sun Oil's Toledo refinery. It costs you nothing to investigate. And it may save you money. Find out how Kemp's wide range of dependable, low-cost Generators (complete with the latest fire checks and safety devices) offer you the best way to solve your problems.

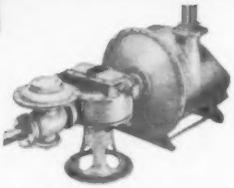
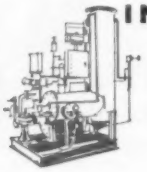


Photo above shows close-up view of Kemp Industrial Carburetor, the heart of every Kemp installation. Assures complete combustion... without waste, without tinkering. Reduces installation costs, simplifies maintenance.

***For more complete facts and technical information, write for Bulletin I-10 to* C. M. KEMP MFG. CO., 405 E. Oliver Street, Baltimore 2, Maryland.**

KEMP OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE DRYERS • SINGEING EQUIPMENT

LADISH

Controlled Quality

PIPE FITTINGS

offer dependability safeguarded by advanced metallurgy

Year after year... in all kinds of service... Ladish Controlled Quality Fittings set new standards of reliability. One reason is the strong reliance on technical progress. Every new facility and advanced technique of modern metallurgy is fully utilized to develop desirable physical properties to maximum limits... while unrelenting test procedures continuously safeguard metallurgical soundness and provide users with authentic data proving the complete dependability of every Ladish Fitting.

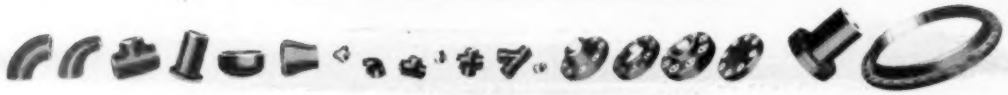
TO MARK PROGRESS

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF... ONE RESPONSIBILITY

LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
St. Louis • Atlanta • Houston • Tulsa • Los Angeles • San Francisco • Havana • Mexico City • Brantford, Ont.



IH scores again...

NEW INTERNATIONAL TRUCKS

Proved as only IH can prove 'em

The 307 new features in the *New* International Trucks have been . . .

Proved in the world's most advanced truck Engineering Laboratory at Fort Wayne, Ind., **Proved again** on International Harvester's 4000-acre Arizona desert Proving Ground.

For profit-minded buyers. *New* International Trucks offer an unmatched combination of values—exactly the right truck for the job, unequalled performance, lowest maintenance and operating costs, maximum driver comfort.

Built the IH way. Choose from 168 basic models in America's most complete truck line. Each model embodies engineering principles, used in International's continuing program of truck research and development, that have resulted in hundreds of exclusive International features which have meant greater profits for truck buyers.

New International Trucks are BUILT as only IH can build them, PROVED as only IH can prove them, a VALUE only IH can give you.

***Now*—the features you want—**
in *America's most complete truck line*

New International styling identified by the IH emblem . . . **Exactly the right power** for every job. First truck builder to offer choice of gasoline or LP gas with Underwriters' Laboratories listing in 1½-ton sizes and other models . . . **Diesel power** optional in models rated 22,000 lbs. and over . . . **Designed by drivers for drivers**—Comfo-Vision cab with one-piece Sweepsight windshield. New comfort and interior styling . . . **Steel-flex frames** proved best in the field . . . **Transmissions** to meet any operating requirement . . . **296 Wheelbases** ranging from 102 inches up . . . **Easy starting and greater fuel economy** . . . **Wide range** of axle ratios for all models . . . **Real steering comfort and control.** Sizes from ½-ton to 90,000 lbs., GVW rating. Now—See The New IH-Built, IH-Proved Internationals at your nearest International Dealer or Branch.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL TRUCKS
Standard of the Highway

There is only one like this

There is only one Rust-Oleum

RUST-OLEUM®

STOPS RUST!

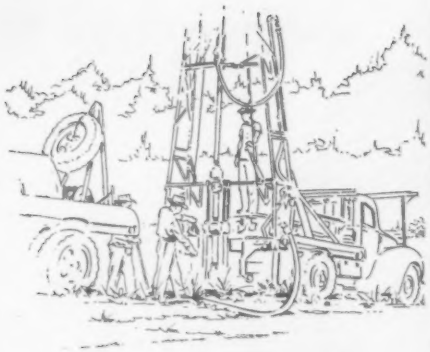
Specify Genuine Rust-Oleum
Accept No Substitute

The *exclusive* Rust-Oleum formula was developed by a Master Mariner during more than 20 years of combating the terrible rust-producing conditions of the sea. It incorporates a *specially-processed* fish oil vehicle that *dries*, is *odor-free*, and is formulated in *many colors*. It may be applied directly over *sound rusted surfaces* after scraping and wirebrushing to remove rust scale and loose particles. See why nearly every type of industry in the world has relied upon Rust-Oleum for over a *quarter century*. Clip the coupon to your letterhead and mail today.

RUST-OLEUM CORPORATION
2542 Oakton Street, Evanston, Illinois

Rust-Oleum Corporation
2542 Oakton Street, Evanston, Illinois
Gentlemen: I am interested in the *complete* Rust-Oleum story. Please send me the facts and the name of my nearest Rust-Oleum Industrial Distributor.

Name_____
Address_____
City_____ State_____



FLOYD KISLER, *one of Independent's younger Party Chiefs, has had 8½ years of continuous geophysical experience. He came to Independent from the Louisiana State University, and worked as a computor and on other key jobs with field crews before becoming Party Chief.*

In Geophysical Work EXPERIENCE is your best assurance of SUCCESS

The record of results achieved during more than 20 years of service to many important oil producers is your assurance of satisfactory returns on your investment in an Independent geophysical survey. Founded in 1932, Independent is one of the oldest exploration contractors in the world operating continuously under the same ownership and management.

Your inquiries are invited.

POINTING THE WAY IXC FOR THE DRILL

Independent *Geophysical Surveys*

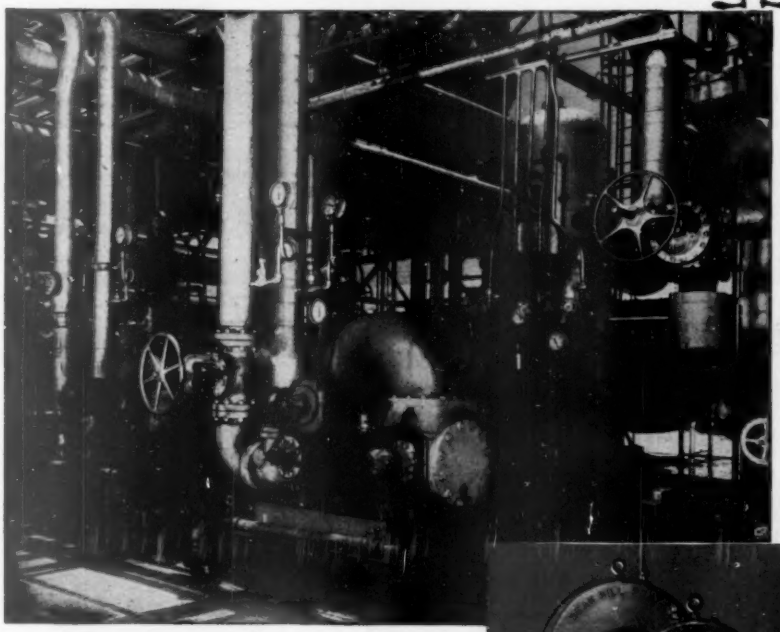
EXPLORATION COMPANY

1973 WEST GRAY ★ HOUSTON, TEXAS

ESTABLISHED 1932

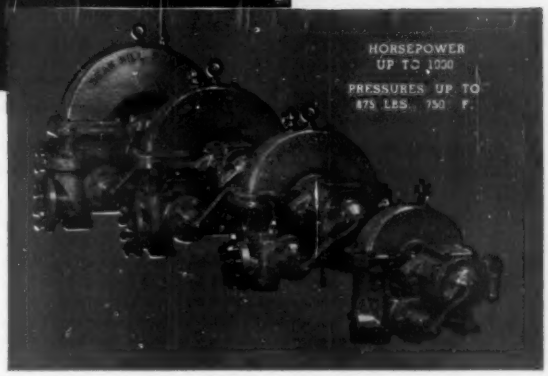
How to stretch a "Power Penny"

You'll never know how much power a penny will buy until you get Dean Hill Steam Turbines on the job. Their super rugged construction, their service-engineered design, their low maintenance, their remarkable power-producing ability all add up to *more power per penny.*



POWER AT WORK

Here are Dean Hill Type DH Steam Turbines at work driving centrifugal pumps at Bay Petroleum Corporation's Chalmette, La. refining operation.



DEAN HILL TURBINES are specifically designed for operation at medium steam pressures. Since they are the single stage, double impact type, low steam consumption is a tremendous economy feature. Steam rates are excellent under these conditions. Get full details and specifications. Write today.

DEAN HILL PUMP COMPANY

Pump and Turbine Engineers Since 1895

INDIANAPOLIS 7, INDIANA

Chicago • New York • San Francisco • Boston • Denver • Albuquerque • El Paso • Salt Lake City • New Orleans • Philadelphia • Tulsa • Los Angeles • Pittsburgh • Houston • Dallas St. Paul • Toledo • Cleveland • Grand Rapids • Birmingham, Ala. • Louisville • Memphis • Nashville • Richmond • Bogota, Col. • Mexico City • Montreal • Reading, Pa. • The Hague, Neth.

DURABLA

METAL PUMP VALVE UNITS ARE USED ON ALL TYPES OF RECIPROCATING PUMPS IN OVER 500 APPLICATIONS

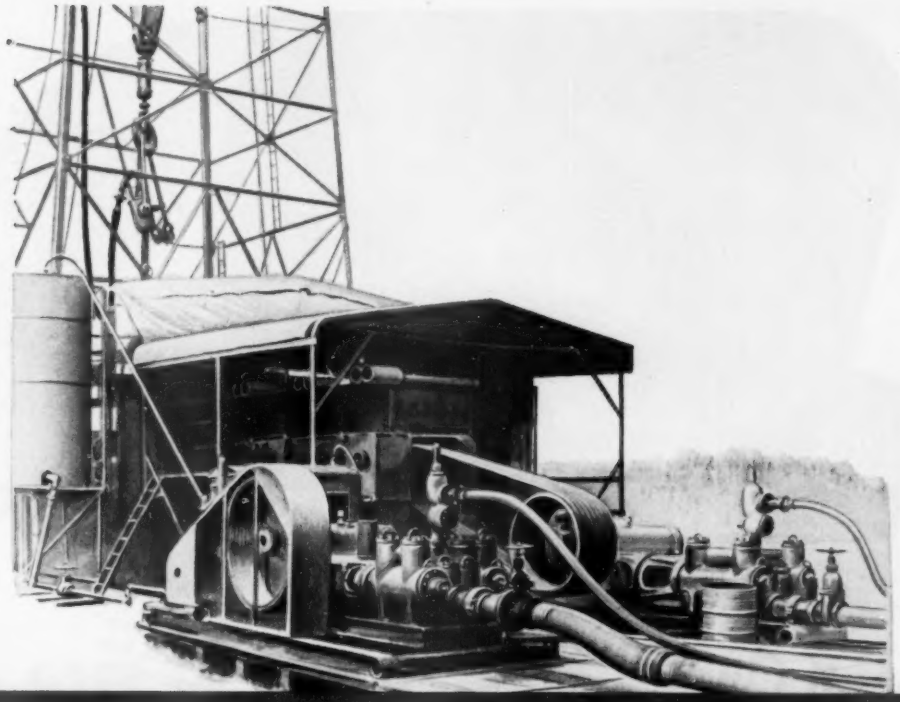
- **METALLURGICAL INDUSTRIES**
  - Mining
  - Steel Plants
  - Refineries
- **RAILROADS**
  - Shops and Roundhouses
  - Water Service
  - Locomotive Feed Water Service
- **PROCESSING INDUSTRIES**
  - Chemical Plants
  - Soap Manufacture
- **STEAM POWER PLANTS**
  - Central Stations
  - Industrial
- **CONSTRUCTION**
- **ROAD BUILDING**
- **WATER WORKS**
- **GAS PLANTS**
- **PETROLEUM INDUSTRY**
  - Oil Field Service
  - Oil Pipe Lines
  - Oil Refineries
- **MARINE**
  - Shipboard Service
  - Cargo Transfer
  - Shipyards and Drydocks
- **DIESEL POWER PLANTS**
  - Public Utility
  - Industrial

Wherever reciprocating pumps are used, and the above chart is merely an outline of some of the principal fields of application, DURABLA METAL PUMP VALVE UNITS* will be found in service, sometimes as standard equipment supplied by the pump manufacturer, sometimes as replacement units on a wide variety of pumps. To assist in ordering and stock keeping there are eleven standard sizes of DURABLA Pump Valve Units, designed to meet over 300 variations in installation requirements. In virtually every conceivable pump application; under extremes of high or low temperature; with highly corrosive fluids; in any position; and in service where long-term freedom from routine inspection and replacement is necessary, DURABLA Pump Valve Units are available to meet your needs.

Write DURABLA Engineering Department for information and Bulletin, Reference OG2

* Patent Numbers 2090486, 2117504

DURABLA MANUFACTURING COMPANY
114 LIBERTY ST. NEW YORK
BRANCHES IN PRINCIPAL CITIES. FOR CANADA REFER: CANADIAN DURABLA LIMITED, TORONTO



Thermoid Industrial Rubber Products — Quality — Service

Thermoid Multi-V-Belts

built to do the job in heavy duty oil field service

Men responsible for oil field equipment will tell you they get maximum wearing quality and top performance from Thermoid Multi-V Belts. On rigs, compressors and pumps, these belts give the kind of service required for most economical operation. One of the reasons for this is Thermoid's first hand knowledge of oil field requirements.

Thermoid V-Belts are pre-stretched to absorb repeated shocks; will withstand moisture and abrasion; provide maximum strength and flexibility.

When you want V-Belts to harness your horsepower more efficiently—do the job better—provide that extra margin of endurance that reduces costs—get Thermoid Multi-V Belts. Available singly or in matched sets from your distributor.

Mid-Continent Office and Warehouse: Houston, Texas
California Office and Warehouse: Los Angeles

SEE OUR CATALOG IN THE COMPOSITE CATALOG

Powerflex Rotary Hose • Trioflex Slim-Hole Rotary Hose • Mud-Flo Slush Pump Hose • Flexible Discharge Units • F.H.P. and Multiple V-Belts • Oil Country Flat Belting

Thermoid

Wire Line Turn Backs • No-Wip Line Savers • Stuffing Box Rings • All Types of Hose • Molded Specialties • Brake Blocks

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

Vickers Inc. hydraulic winch in operation on a Piasecki Hup-1 helicopter. Inset at left shows built-in Cleveland worm gearing.

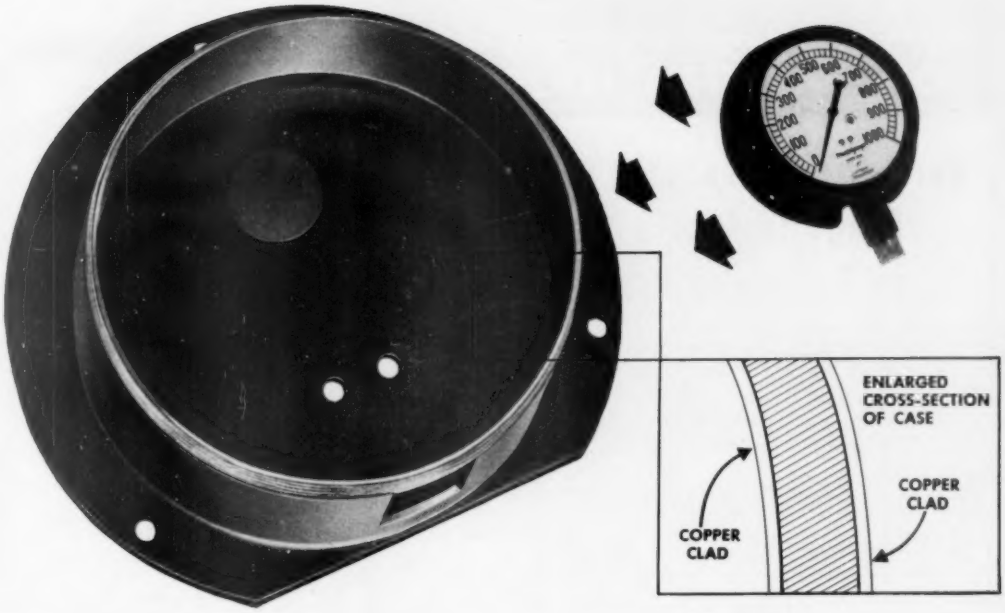
Small Cleveland gearing speeds sea rescue

CLEVELAND worm gearing now has a part in a new kind of sea rescue. Just after the war, for the first time, a Vickers hydraulically-operated winch mounted on a helicopter hoisted two men to safety when an oil barge ran aground. Now use of the winch is standard practice, replacing hard-to-climb rope ladders previously used.

Vickers Inc. chose Cleveland worm gearing to drive the winch because it is small enough and light enough to satisfy rigid weight and bulk restrictions and is capable of governing efficiently sudden stops and starts and changes of direction involved in rescue work. To date Cleveland worm gearing has participated in over 1700 Korean missions.

Cleveland manufactures worm gearing and worm gear speed reducers in a wide range of types and sizes, large and small, to meet the requirements of any machinery builder or user. Write today for Catalog 400. The Cleveland Worm and Gear Company, 3286 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.



A CASE TO MATCH "Mastergauge" QUALITY

Few products have ever achieved the leadership that has been conceded to the Marsh "Mastergauge." But instead of allowing the "Mastergauge" to coast on its laurels we have kept right on making it better. An example of this is the **NEW "Marshalloy" CASE**

The recently developed case is accurately formed in steel of boiler plate thickness; then heavily copper-clad so that it has the corrosion resistance of a solid copper case with the strength of steel.

Such a case is four times as strong and one-third lighter than conventional cast iron cases. It is finished in a newly developed, corrosion-resistant satin-black enamel that makes it as attractive as it is durable.

The new case is fitted with Marsh safety blow-out plug — another typical Marsh advancement. Ask for information covering gauges for all services.

SOCKET, TUBE AND END-PIECE FUSED INTO ONE UNIT

Just as welded piping is more sound than any mechanical joining, the fusing of the socket, tube and end-piece into an integral unit is the most dependable pressure gauge construction ever known.

Welding these dissimilar parts together is a tricky problem — fully solved by a special process which produces

THE "Consweld" TUBE

The photo of an actual section through the socket shows the perfect fusion. Instrument men have called this the most significant pressure gauge development in recent years.

MARSH GAUGES

"THE STANDARD OF ACCURACY"

MARSH INSTRUMENT CO. *Sales affiliate of Jas. P. Marsh Corporation*
Dept. L, Skokie, Ill. *Export Dept., 3501 Howard St., Skokie, Ill.*

MANUFACTURERS OF THERMOMETERS • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES

WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

Vickers Inc. hydraulic winch in operation on a Piasecki Hup-1 helicopter. Inset at left shows built-in Cleveland worm gearing.

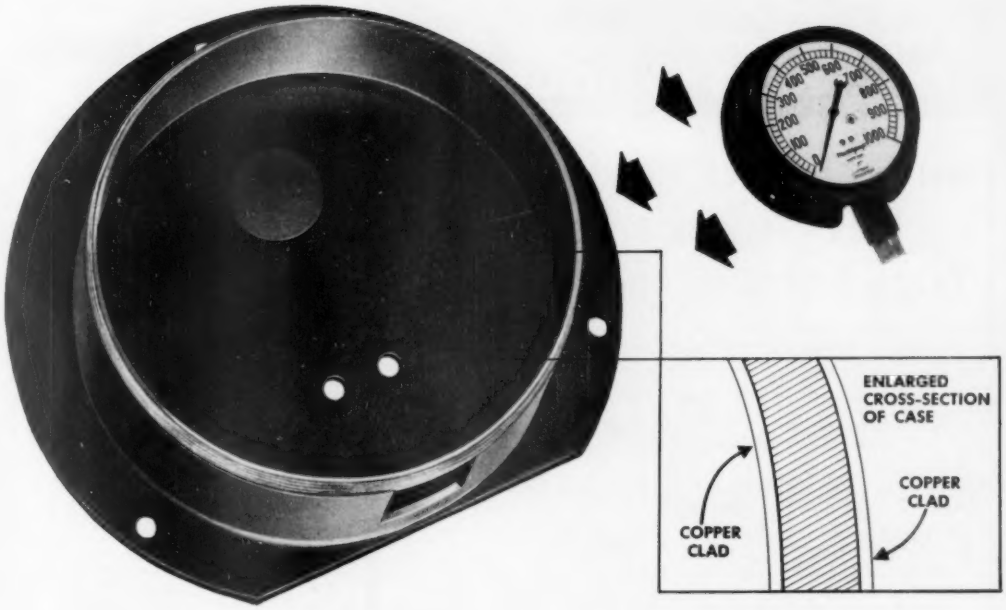
Small Cleveland gearing speeds sea rescue

CLEVELAND worm gearing now has a part in a new kind of sea rescue. Just after the war, for the first time, a Vickers hydraulically-operated winch mounted on a helicopter hoisted two men to safety when an oil barge ran aground. Now use of the winch is standard practice, replacing hard-to-climb rope ladders previously used.

Vickers Inc. chose Cleveland worm gearing to drive the winch because it is small enough and light enough to satisfy rigid weight and bulk restrictions and is capable of governing efficiently sudden stops and starts and changes of direction involved in rescue work. To date Cleveland worm gearing has participated in over 1700 Korean missions.

Cleveland manufactures worm gearing and worm gear speed reducers in a wide range of types and sizes, large and small, to meet the requirements of any machinery builder or user. Write today for Catalog 400. The Cleveland Worm and Gear Company, 3286 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.



A CASE TO MATCH "Mastergauge" QUALITY

Few products have ever achieved the leadership that has been conceded to the Marsh "Mastergauge." But instead of allowing the "Mastergauge" to coast on its laurels we have kept right on making it better. An example of this is the **NEW "Marshalloy" CASE**

The recently developed case is accurately formed in steel of boiler plate thickness; then heavily copper-clad so that it has the corrosion resistance of a solid copper case with the strength of steel.

Such a case is four times as strong and one-third lighter than conventional cast iron cases. It is finished in a newly developed, corrosion-resistant satin-black enamel that makes it as attractive as it is durable.

The new case is fitted with Marsh safety blow-out plug — another typical Marsh advancement. Ask for information covering gauges for all services.

SOCKET, TUBE AND END-PIECE FUSED INTO ONE UNIT

Just as welded piping is more sound than any mechanical joining, the fusing of the socket, tube and end-piece into an integral unit is the most dependable pressure gauge construction ever known.

Welding these dissimilar parts together is a tricky problem — fully solved by a special process which produces

THE "Conoweld" TUBE

The photo of an actual section through the socket shows the perfect fusion. Instrument men have called this the most significant pressure gauge development in recent years.

MARSH GAUGES

"THE STANDARD OF ACCURACY"

MARSH INSTRUMENT CO. *Sales affiliate of Jas. P. Marsh Corporation*
Dept. L, Skokie, Ill. *Export Dept., 3501 Howard St., Skokie, Ill.*

MANUFACTURERS OF THERMOMETERS • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES

of special interest to readers of
OIL and GAS JOURNAL

Here's an Unbeatable Combination . . . Ready to Tackle Your Tough Corrosion Problems

- **No other warehouse has more technical and school-of-hard-knocks experience in battling corrosive attacks.**
- **METAL GOODS CORPORATION possesses the most complete warehouse stock of stainless steels and high nickel alloys in the Southwest.**

If you are faced with a difficult corrosive situation, it is this combination that can bring about a reduction in costly shutdowns.

This explains why the petroleum industry continues, year after year, to turn to Metal Goods Corporation to assist it in combating corrosive conditions.

To get the facts about your specific corrosion problem from a metallurgical specialist, call for a Metal Goods Corrosion Consultant. To get the most dependable corrosion-resistant alloys from a reliable source, order from your nearest Metal Goods Corporation warehouse.

THERE'S AN MGC REPRESENTATIVE NEAR YOU:

OFFICES AND WAREHOUSES

St. Louis 15, Missouri
5239 Brown Avenue
Nelson L. Hower
Phone: GOodfellow 1234

Kansas City 16, Mo.
1300 Burlington
Frank D. Hogan
Phone: NOrclay 3516

New Orleans 12, La.
432 Julia Street
Carl T. Wedemeyer
Phone: CAnal 7373

Tulsa 3, Oklahoma
302 North Boston
Scott J. Harrison
Phone: 4-1175

Houston 3, Texas
711 Milby Street
Harris T. Gregg
Phone: CEntral 8881

Denver 2, Colorado
2425 Walnut Street
Neal Dehn
Phone: AComa 5891

Dallas 9, Texas
6211 Cedar Springs Rd.
Sam D. Hodgdon
Phone: ELmhurst 3271

SALES SERVICE OFFICES

Wichita, Kansas
2200 East Central
Ray Noller
Phone: 7-8921

Jackson, Mississippi
781 Raymond Road
George E. Akerberg
Phone: 5-2711

Memphis, Tennessee
713 Columbian Mutal Tower Bldg.
Robert W. Downs
Phone: 5-8721

Omaha, Nebraska
3515 No. 67th Avenue
C. M. Cooley
Phone: Walnut 1112

Beaumont, Texas
238 Bowie Bldg.
Lee T. Dodson
Phone: 4-7536, 4-7537

Decatur, Illinois
1305 West Sunset
Arlie W. Tempel
Phone: 8-1314

Baton Rouge, Louisiana
4419 Mimosa Street
Paul P. Vidovic
Phone: 4-4738

Indianapolis 2, Ind.
1333 N. Pennsylvania
Harry L. Newton
Phone: Lincoln 4980

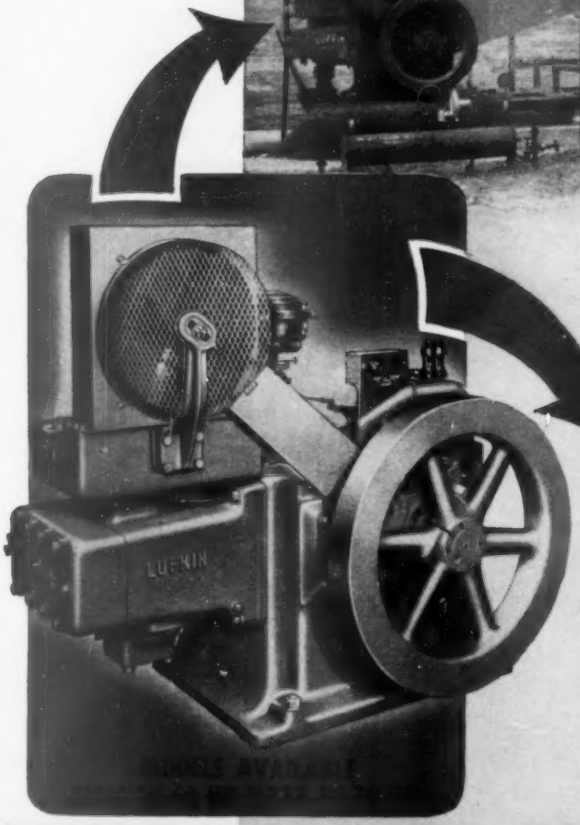
Fort Worth, Texas
3821 Carolyn
John M. Turbitt
Phone: FOrtune 4369

San Antonio, Texas
2012 Alamo Natl. Bldg.
Roy D. Bagaley
Phone: GArfield 3161

Davenport, Iowa
924 State Street
Robert L. Tharp
Phone: 2-3156

1. One-stop buying of all available metals!
2. Large warehouse stocks!
3. New product information!
4. Prompt service!
5. Engineering help!
At Your Fingertips...
when you deal with
METAL GOODS CORPORATION
GENERAL OFFICES: ST. LOUIS 15, MISSOURI

Lufkin ENGINES



THE *Lufkin* H333

A DEPENDABLE RUGGED 20-30 HP OIL FIELD ENGINE

Lufkin engine-unit combination means one responsibility—one source for your entire surface pumping equipment. Fifty years of know-how in manufacturing oil field equipment is your assurance of satisfactory, long-life, low upkeep, and dependable service. The Lufkin H-333 gas engine is built around the needs of the oil fields.

- Two cylinder, two cycle, crosshead design for smoothness and long life.
- Condenser cooling for more efficient cooling and lubrication. High even temperatures desired for sour gases are maintained. No water pump troubles.
- Full pressure lubrication with oil under pressure forced to all wear points for longer life and trouble-free service.
- Easy starting by hand. Optional: Built in 12-volt electric starting system, or air-gas motor starting requiring only 25# gas pressure.

Lufkin engines can take it, which has been proven in the field over many years of continuous operation. We invite you to write direct or check with your nearest Lufkin representative for information and delivery.

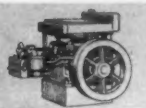
LUFKIN, TEXAS

Branch sales and service Houston, Dallas, New York, Tulsa, Los Angeles, Seminole, Oklahoma City, Corpus Christi, Odessa, Kilgore, Wichita Falls, Casper, Wyoming, Great Bend, Kansas.

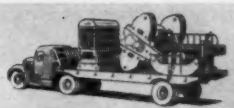
Lufkin Equipment in CANADA is handled by

THE LUFKIN MACHINE CO., LTD. 14321 108th Avenue, Edmonton, Alberta, Canada.

LUFKIN PUMPING UNITS



LUFKIN-COOPER-BESSEMER ENGINES



LUFKIN OIL FIELD AND INDUSTRIAL TRUCK TRAILERS

INDUSTRIAL SPEED REDUCERS AND INCREASERS

DIVISION LUFKIN FOUNDRY & MACHINE COMPANY INDUSTRIAL, MILL AND AUTOMOTIVE SUPPLIES

Letter to a Skeptic

Lane-Wells Company

Dear Tom:

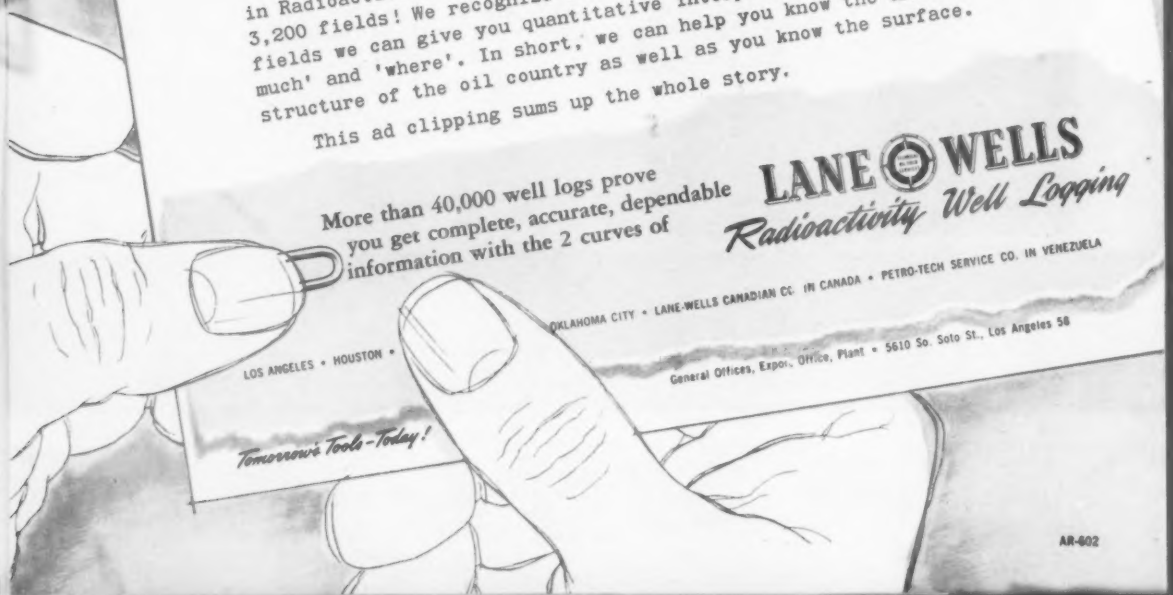
Is that the way to do a friend -- challenge his statements, and then duck out before he can prove them? Sure, I know you were called away, this afternoon, but you asked me to prove the value of Lane-Wells Radioactivity Well Logging, and by gosh, I'm going to do it!

You agreed that Radioactivity Well Logging worked in both open hole and cased hole, and that the Neutron Curve indicated the fluid-bearing zones in the formations defined by the Gamma Ray Curve. But you got away before I could get across the important point that in Lane-Wells Logging both these curves have high repeatability -- which means reliability; you can depend on their information. There are plenty of logs in our files that prove it; we'll show you some that have been released, any time you like.

You agreed also that the casing collar log was a valuable guide for all future work in the well -- I just want to emphasize that a great part of that value lies in Lane-Wells accurate depth measurements. You know that's true.

But the one big thing to keep in mind is Lane-Wells experience in Radioactivity Well Logging -- more than 43,000 logs in over 3,200 fields! We recognize the dozens of local variations. In some fields we can give you quantitative interpretation to tell 'how much' and 'where'. In short, we can help you know the underlying structure of the oil country as well as you know the surface.

This ad clipping sums up the whole story.


More than 40,000 well logs prove you get complete, accurate, dependable information with the 2 curves of
LANE WELLS
Radioactivity Well Logging
OKLAHOMA CITY • LANE-WELLS CANADIAN CO. IN CANADA • PETRO-TECH SERVICE CO. IN VENEZUELA
LOS ANGELES • HOUSTON •
General Offices, Export Office, Plant • 5610 So. Soto St., Los Angeles 58
Tomorrow's Tools - Today!
AR-602

IT ALL BEGAN IN '33

another important story about

4-CYCLE V-ANGLE COMPRESSORS

Repeated installations of Ingersoll-Rand Gas-Engine Driven Compressors keep pace with steady growth of Lloyd Corporation, Ltd. of California Gas Booster plant

When Lloyd Corporation, Ltd. back in '42, built its booster plant in Ventura, Cal., it selected a 300-hp Ingersoll-Rand XVG compressor for gas-lift service. The XVG had revolutionized oilfield practices when it was introduced in 1933 as the first V-angle gas-engine-driven compressor, and had quickly achieved world fame and acclaim for its outstanding performance in all kinds of services.

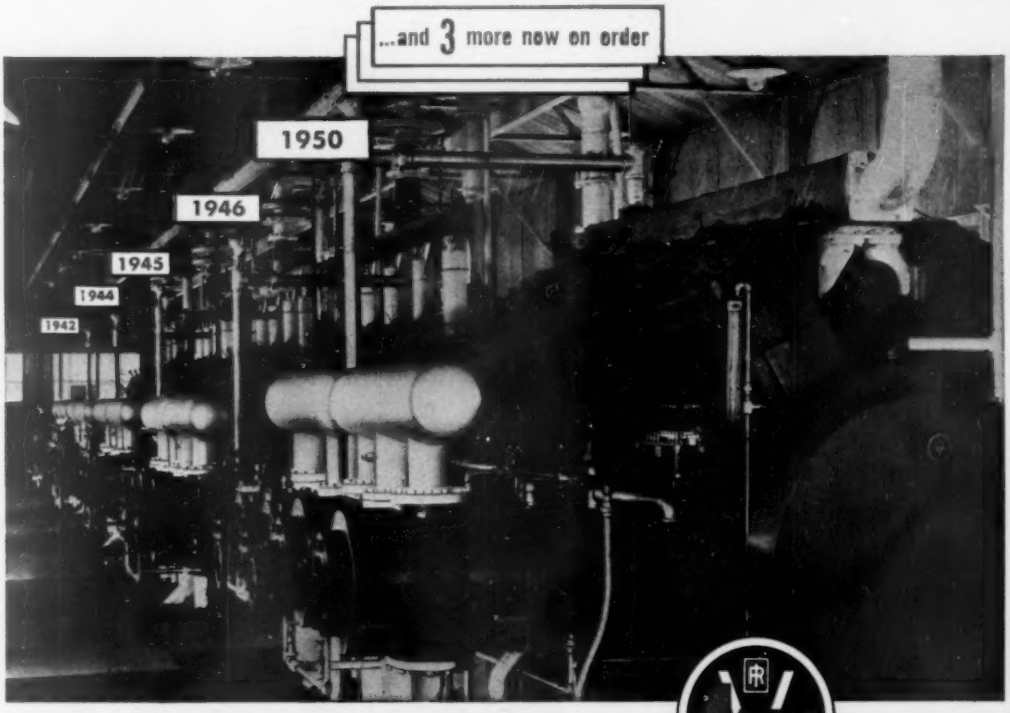
After two years' first-hand experience with its XVG, Lloyd installed another one . . . and additional units in '45 and '46.

Then in 1950 it purchased a different compressor. This machine was also an Ingersoll-Rand, and fit into the same amount of space . . . had the same number of cylinders. And it had all of the important, proven, and desirable features of the XVG.

But it had 45% more capacity. It incorporated many new and advanced design features that make it an even better machine. This was the modern design of the famous XVG. It is known as the SVG . . . made in three sizes, 330, 440 and 550 horsepower.

Lloyd liked the SVG, too. They ordered three more, two for '52 and one for delivery in early '53.

Let your I-R representative tell you more about the SVG and the other units in the full line of Ingersoll-Rand 4-cycle gas engines and compressors.



Ingersoll-Rand

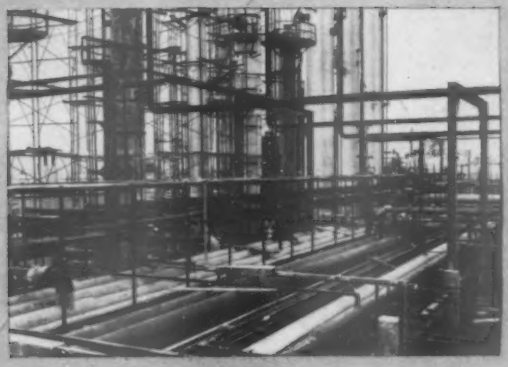
11 BROADWAY, NEW YORK 4, N. Y. 840-6

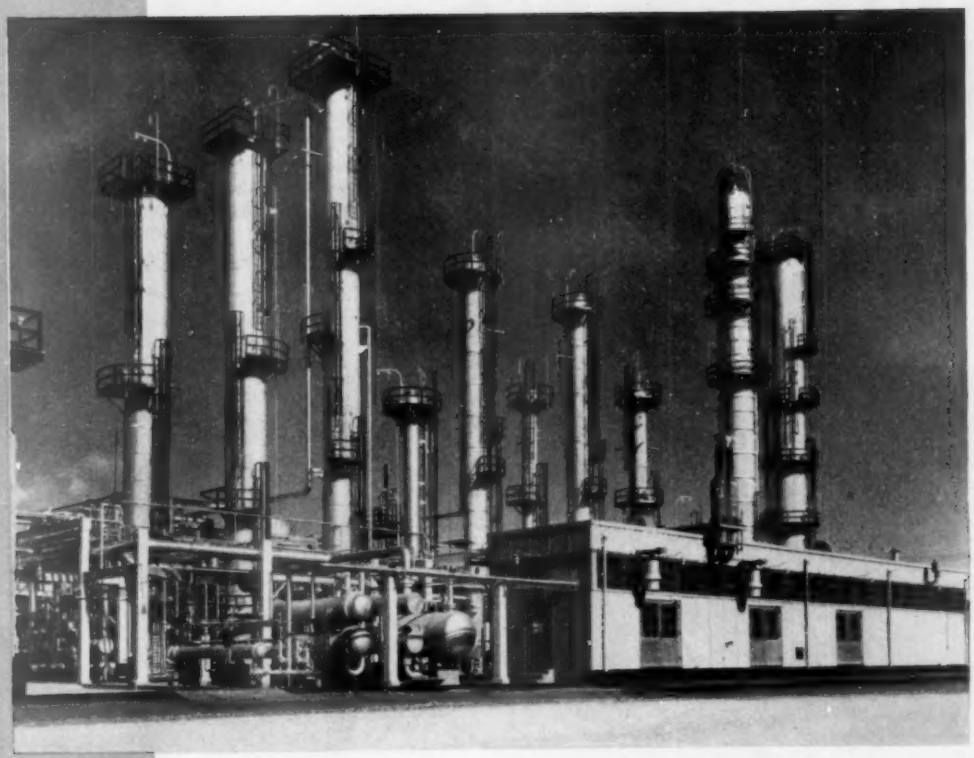
COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES

Cosden is first
to produce
all three aromatics
plus Platformate

with PLATFORMING-UDEX

facilities . . . built by PROCON





Completed by Procon in 11 months, the Platforming-Udex installation at the Big Spring, Texas, refinery of Cosden Petroleum Corporation is the **first** to produce all three aromatics — benzene, toluene, and xylene — plus a high octane motor fuel blending component.

Handling a charge of approximately 4500 barrels per day, the new facilities include a feed preparation section, a UOP Platforming Unit, a Udex unit, and a super-fractionation section. In addition, Procon also built accessory processing equipment, roadways, buildings, and utilities. All work was handled with maximum dispatch, and labor costs for the completed job were considerably below pre-construction estimates.

The successful and economical completion of this new plant is typical of Procon service on large and small construction projects for petroleum refiners throughout the world.

PROCON *Incorporated*

PROCESS CONSTRUCTION

1111 MT. PROSPECT ROAD, DES PLAINES, ILL., U. S. A.

IN ENGLAND

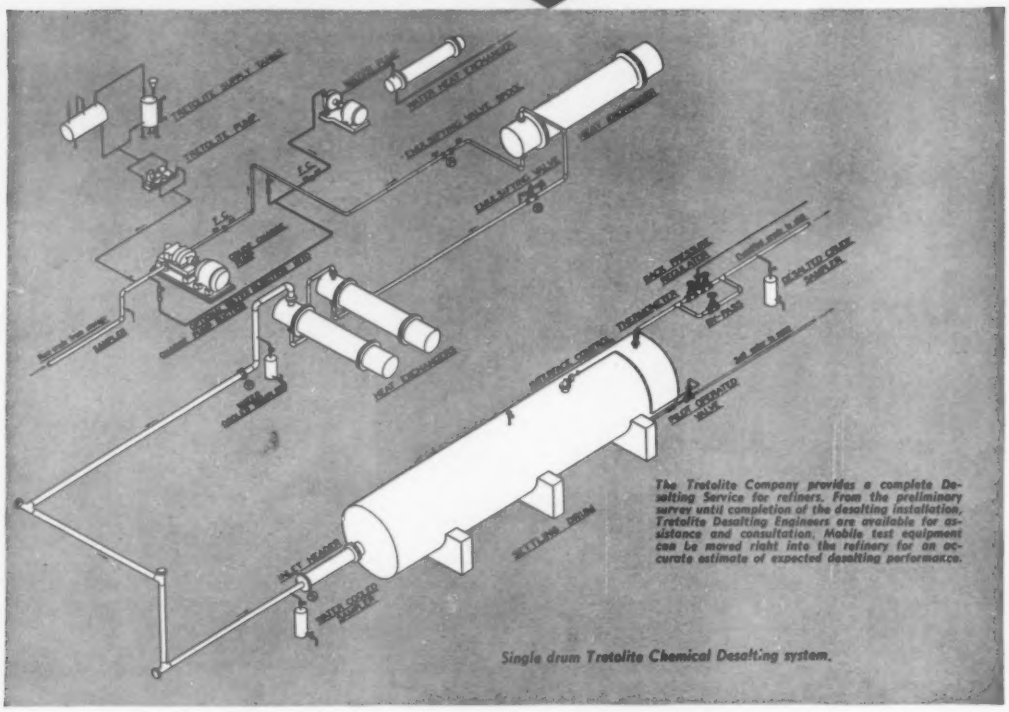
PROCON (*Great Britain*)
LIMITED

112 STRAND, LONDON, W. C. 2

TRETOLITE DESALTING

UTILIZES CONVENTIONAL REFINERY EQUIPMENT

Examine the flow diagram below, note the equipment required. Every item is conventional, already available in most refineries. A Tretolite Desalting plant often can be assembled from existing refinery equipment, thereby holding installation costs at minimum.



The Tretolite Company provides a complete Desalting Service for refiners. From the preliminary survey until completion of the desalting installation, Tretolite Desalting Engineers are available for assistance and consultation. Mobile test equipment can be moved right into the refinery for an accurate estimate of expected desalting performance.

Single drum Tretolite Chemical Desalting system.

A recent survey of Tretolite Desalting installations disclosed that Tretolite is now desalting over 1,000,000 barrels per day, with an average salt-removal percentage of 95, at an average cost per barrel of 2.5 mills.

For complete information on Tretolite Desalting, write or call the

TRETOLITE COMPANY
SAINT LOUIS 17, MISSOURI
LOS ANGELES 22, CALIFORNIA

TD 52-3

UNIBOLT X-BEANS

put needle valve selectivity in your positive choke...

74 sizes of X-Beans up to ½ inch

Because UNIBOLT X-Beans are drilled in increments of 5 per cent and 10 per cent of well flow rather than in increments of 1/64-inch in orifice size, the flow of fluid or gas from a well can now be positively controlled with a degree of accuracy never before attained. Say, for example, a well produces 100 bbls. through a 1/64-inch choke. To increase the choke to the next largest fractionally drilled size, 2/64-inch, would increase the production to approximately 400 bbls. On the other hand, a well that produces 100 bbls. through a size X-35 UNIBOLT X-Bean would produce only 105 bbls. through the next largest size X-Bean, X-35.5; 110 bbls. through an X-36, and so on. Here is positive protection against harmful over-producing a well in order to make its allowable, as is sometimes done through an adjustable choke.

UNIBOLT X-Beans are available in economical, renewable inserts in sizes up to X-40.5 (13/64-inch). Larger beans are standard full 6-inch length, drilled full length.

UNIBOLT Positive Choke Bodies and Cage Nipples accommodate either X-Beans or regular beans, and the Positive Choke Body may be easily converted to a Wing Valve or Adjustable Choke.

only UNIBOLT choke bodies and cage nipples accommodate X-BEANS

THORNHILL-CRAVER COMPANY

P. O. BOX 1184 HOUSTON, TEXAS

It's New!
...eliminates the need for upset end casing—gives greater inside clearance for the drilling bit
...permits easy, faster coupling to power-tight position
...assures a safe and economical support for heavy deep well strings
...provides a joint comparative in strength to that of the body of the pipe

NATIONAL *Buttress-thread* CASING

CASING CROSS-OVER JOINT

NATIONAL Buttress Thread Casing was developed to give the petroleum industry something that was very much needed—a casing joint that will support the weight of casing for deep wells with the maximum of safety and economy.

Practically as strong as the body of the pipe, the high tensile strength of the buttress thread joint is due largely to the combined effect of the completely engaged runout threads and the three-degree flank angle of the thread which supports the weight of the casing in the well.

Hoop stresses, which in regular joints tend to reduce the permissible casing load, are here compensated for by the small flank angle which materially reduces this effect.

In the NATIONAL buttress thread joint, the *full* section of the casing is utilized in supporting the weight of the string. The coupling threads engage the casing threads throughout their *entire* length. That's because the ¾ inch-per-foot taper is continuous and without the conventional fast angle vanishing threads. In addition, the V-notch and fatigue effects on joint strength are almost entirely eliminated. The need for upset end casing is also eliminated which assures greater inside clearance for the drilling bit.

Only five threads per inch and the open form of the buttress thread permit easy stabbing, rapid spinning and require fewer strokes to pull the coupling up to power-tight position.

In most of the point-strength tests made, the buttress threaded joints have withstood loads equal to 100% of the ultimate strength of the body of the pipe. Distribution of the total joint efficiencies showed great uniformity with a resulting high minimum value.

For more information on National Seamless Drill Pipe Casing and Tubing, write National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Ask for Bulletin No. 15.

COUPLING CROSS-OVER JOINT

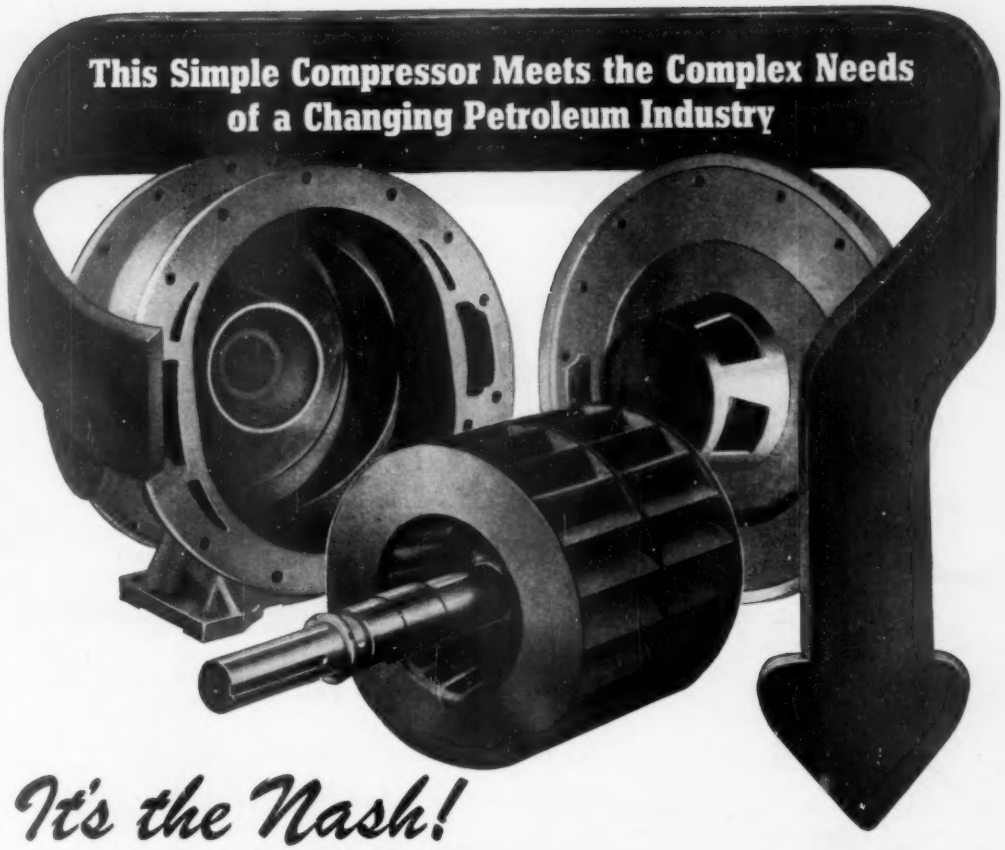
NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NATIONAL SEAMLESS *drill pipe... casing... tubing*

USS

UNITED STATES STEEL

This Simple Compressor Meets the Complex Needs of a Changing Petroleum Industry



It's the Nash!

Here is a compressor presenting advantages found in no other device. Nash Compressors have only one moving part, rotating without metallic contact with the pump casing. No internal lubrication is required. Yet they produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure.

There are no valves, gears, pistons, sliding vanes, or other complicated wearing parts in a Nash. Compression is secured by an entirely different principle of operation. Because of this, gas pumping problems difficult with ordinary pumps are often easily handled by the Nash. For example, Nash Pumps are standard equipment in the Synthetic Rubber Industry, where they have met the needs of new and difficult processes.

Nash Compressors are compact and save space. They run without vibration, and compression is without pulsation. They maintain original performance over long periods. Service is assured by a nationwide net-work of Engineering Service offices. Instructive bulletin shows how they operate. Write for it.

One moving part.

No internal wearing parts.

No valves, pistons, or sliding vanes.

No internal lubrication.

Low maintenance.

Slugs of liquid entering pump do no harm.

Non-pulsating pressure.

Saves floor space.

75 pounds in a single stage.

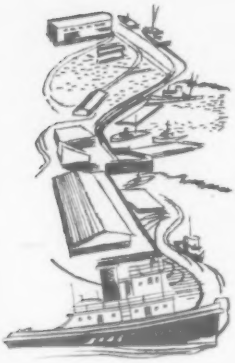
NASH ENGINEERING COMPANY

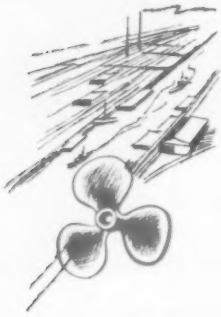
274 WILSON, SO. NORWALK, CONN.

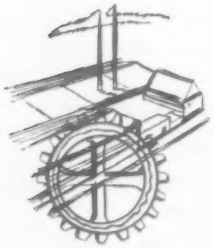
Oil

for the Oil Industry

Avondale





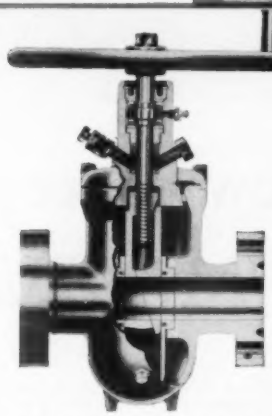


3 facilities to serve you

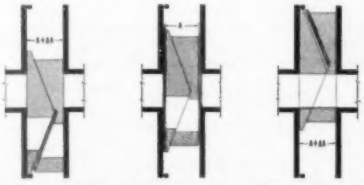
. . . the main plant at Avondale (tugboat, towboat and barge building, tank cleaning, steel fabrication); the "Quick Repair Yard" on Harvey Canal (dry docking, propeller work, quick repairs); the Service Foundry Division (gear cutting and castings). All 3 facilities stand ready to serve the Oil Industry . . .

service integrity experience

Avondale Marine Ways, Inc.



All W-K-M Valves have a perfectly smooth bore. There are no cavities or projections to cause turbulence or to collect sediment. Gates and seats are protected against cutting or damage of any kind. These advantages are a result of the W-K-M Expanding Gate development which is explained below.



In closed position, the gate (left) and segment (right) seal tightly against both seats.

When opening or closing, the gate and segment are in neutral position permitting free upward or downward movement of the gate assembly.

When open, the gate and segment again seal tightly against both seats and the bore of each lines up perfectly with the bore of the body to provide a smooth, full-round conduit.

You can ***completely*** overhaul a W-K-M Valve right on the tree in one hour! When overhauled, the valve becomes as good as new, ready for many more years of efficient, trouble-free service.

There is no need to go into great detail to point out the advantages and economies of on-the-spot repair or overhaul. Frequently the time and money saved will amount to much more than the cost of the valve.

Long run performance is far more important than first cost. When you buy, specify W-K-M and you'll be sure of satisfactory operation for the life of your tree.

W-K-M COMPANY

P. O. BOX 2117 HOUSTON 1, TEXAS

727 W. SEVENTH STREET, LOS ANGELES, CALIF.

EXPORT OFFICE: 30 Rockefeller Plaza, New York, N. Y.

W-K-M *Valves*

ALL W-K-M VALVES HAVE **Through-Conduit Fluid Passage • Parallel Expanding Gate Assembly**

Oversize Replaceable Seats • Double Row Thrust Bearings on Stem • Internal Lubrication

infra-red analysis *tells how much of a selected component exists in gas mixtures. Here, continuous analysis recorded by an* ***ElectroniK*** *potentiometer on a refinery's graphic panel is used for actual process control.*

mass spectrometry *separates materials on the basis of their different molecular weights . . . finds what constituents are present in what quantity. Above is a "package" mass spectrometer in which an* ***ElectroniK*** *instrument records test data.*

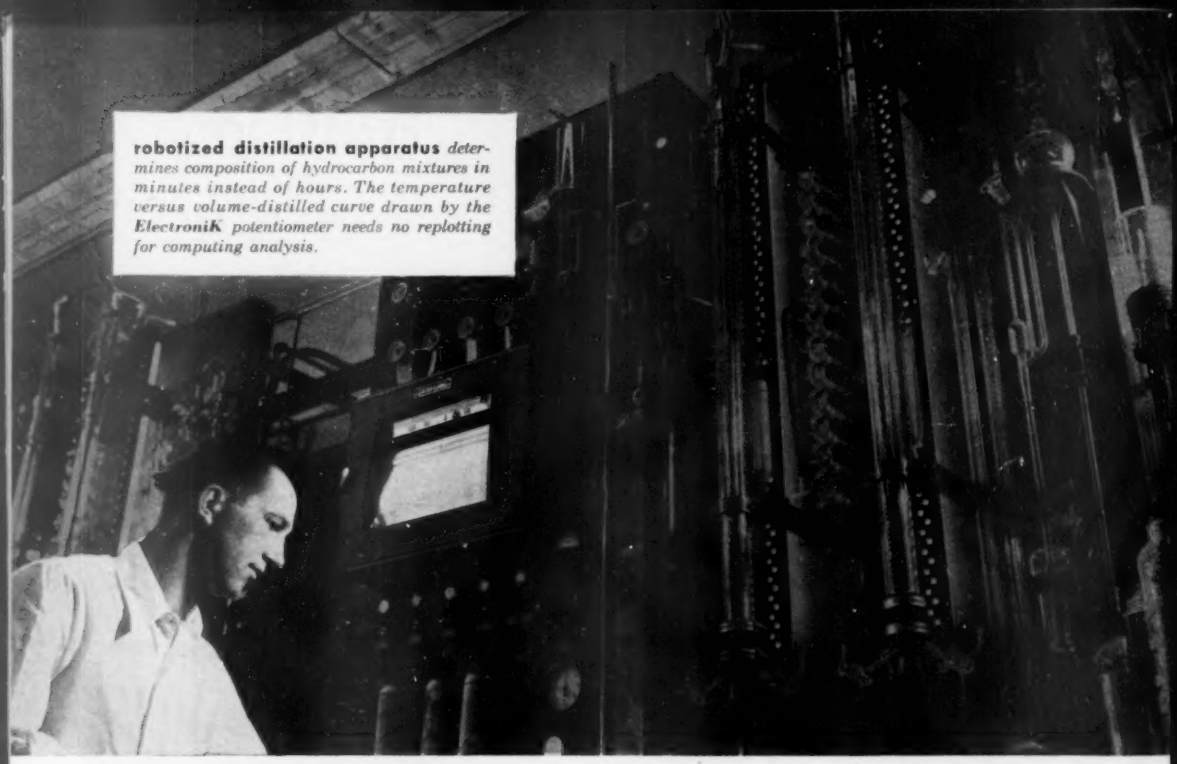
gas analyzer, *operating on the thermal conductivity principle, combines an* ***ElectroniK*** *recorder, analysis cell and accessories in a single panel assembly.*

New concepts *utilize*

These are some of the manufacturers who use *ElectroniK* instruments in their analyzers

Products of the companies checked are illustrated on these pages

Applied Research Laboratories
√ Baird Associates
Bausch and Lomb
Beckman Instruments, Inc.
Consolidated Engineering Corporation
√ Davis Emergency Equipment Co.
√ General Electric Co.
Jarell-Ash
Mine Safety Appliances Co.
North American Philips Co., Inc.
Perkin-Elmer Corp.
√ Podbielniak, Inc.
Precision Scientific Co.
E. H. Sargent & Co.
Tracer Laboratories
Turner-Burrell Technical Supply Co.



robotized distillation apparatus *determines composition of hydrocarbon mixtures in minutes instead of hours. The temperature versus volume-distilled curve drawn by the* ***ElectroniK*** *potentiometer needs no replotting for computing analysis.*

# of process control

ElectroniK instruments

FROM the analytical laboratory comes a new concept of industrial process control, based directly on the desired chemical or physical characteristics of the product.

Continuous analyzers now make it possible to measure composition of gases and liquids accurately and automatically . . . to record this information . . . even to actuate automatic controls. Instead of temperature, pressure and flow, these new systems deal in terms of refractive index, density, ultraviolet and infrared spectra, radiation intensity and absorption.

An essential component of all these systems is automatic recording. To fill this critical function, leading manufacturers of automatic analyzers choose *ElectroniK* instruments. They choose them for their exceptional accuracy, that exploits fully the inherent precision of the new measuring techniques. They choose them, too, for sensitivity that records every essential change in readily readable detail. And they prefer *ElectroniK* recorders for their simple, rugged design that guarantees dependable service under any industrial conditions.

Your local Honeywell engineering representative will be glad to discuss the role of *ElectroniK* instruments in product-analysis systems . . . or in any conventional process control. Call him today . . . he is as near as your phone.

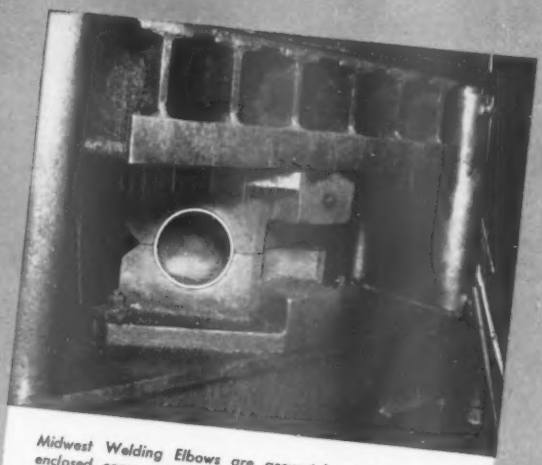
MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4488 Wayne Ave., Philadelphia 44, Pa.

● **REFERENCE DATA: Write for Bulletin 15-14, "Instruments Accelerate Research."**

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

Held to CLOSE LIMITS

The child cooped in his playpen is held to close limits for his own safety and health. Midwest Welding Fittings are held to close limits to save you time and money on your welded piping. Because of their exceptional dimensional accuracy and uniformity (see below), all pipe can be cut in advance according to drawings with assurance of accurate fit. Welders do not have to spend costly time struggling to line up fittings and pipe. Welding proceeds rapidly and economically with no time-wasting compensation for inaccuracies. It will pay you to specify "Midwest" the next time you order welding fittings.



Midwest Welding Elbows are accurately sized in totally enclosed compression dies that exactly control metal distribution throughout fitting. The result is true circular cross section and accurate radius, included arc, and tangents.

MIDWEST PIPING & SUPPLY CO., INC.
Main Office: 1450 S. Second St., St. Louis 4, Mo.
Plants: St. Louis, Passaic, Los Angeles and Boston

Sales Offices:
New York 7—50 Church St. • Chicago 3—79 West Monroe St.
Los Angeles 33—520 Anderson St. • Houston 2—1213 Capitol Ave.
Tulsa 3—224 Wright Bldg. • Boston 27—426 First St.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

MIDWEST WELDING FITTINGS

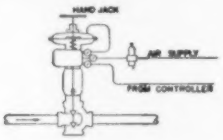
6108

MIDWEST WELDING FITTINGS Improve Piping Design and Reduce Costs

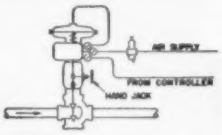
FISHER® Versatile Usage

TYPICAL EXAMPLES OF FISHER DIAPHRAGM MOTOR VALVE WIDE RANGE ADAPTABILITY

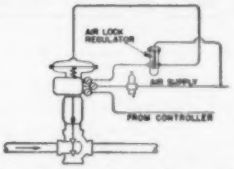
Built for your specific requirements, Fisher Diaphragm Motor Valves are manufactured to handle pressure conditions up to 10,000 pounds, for high pressure drops and are available in metals for high temperature work.



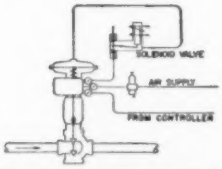
DMV with Hand Jack Operator. Allows for manual operation against spring action. Limits travel of valve. Example — Maximum opening in spring opened valve. Minimum closing in spring closed valve.



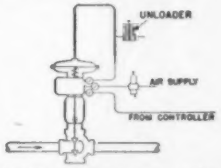
DMV with Continuously Connected Handwheel. Operator can open or close valve against controller action. Can operate valve manually if operating medium fails. Can set maximum opening or minimum closing of inner valve.



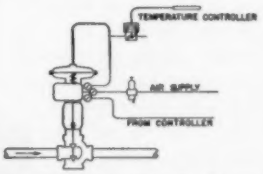
DMV with Air Lock. Should operating air supply fail, air lock regulator closes, locking pressure on diaphragm — valve remains at last position until operating air supply is re-established.



DMV with Remotely Actuated Electric Solenoid Trip Out. Valve may be fully opened or closed by unloading operating pressure from diaphragm by solenoid operation. Solenoid is actuated from manual switch or an electric tie-in circuit.



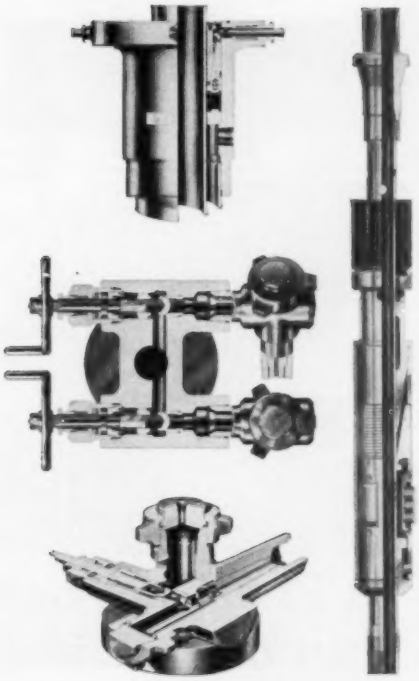
DMV with Air Cut-Out Feature. Valve member becomes inoperate, subject to manual handling to re-establish operation. When controller removes air from diaphragm, UNLOADER opens. Valve remains in this position — UNLOADER orifice is too large to allow air pressure to be re-established.



DMV — with Auxiliary Controller Over-ride. An auxiliary controller, such as temperature, placed in operating air line to diaphragm — can over-ride action of main control function by unloading diaphragm and taking over functional operation of DMV.

FISHER GOVERNOR COMPANY • MARSHALLTOWN, IOWA

What one company do you think has done the most in the past five years to improve production equipment performance?



O-C-T "C-19" Casing Head . . . the first casing head designed specifically to eliminate open hole hazards in deep, high pressure wells ● O-C-T "JE" Flow Control . . . effects cost and weight savings up to 90% ● O-C-T "JE" Dual Flow Control . . . replaces thirteen different fittings and saves as much as $700 ● O-C-T Packers . . . designed to eliminate the four major causes of packer failures.

Here's what O·C·T has done!

During the twenty-five years that Oil Center Tool Company has served the oil industry, O-C-T products have been designed with specific industry needs in mind . . . manufactured with performance in mind . . . sold with service in mind.

But never before in our history have we introduced as many truly outstanding products . . . products that have received immediate industry-wide acceptance . . . as we have during the past five years.

Each one of these new O-C-T products was designed to improve production equipment performance and safety . . . and industry acceptance has proved the need.

But rather than rest on these laurels, O-C-T has instituted an even greater development program to bring about other improvements in the future to meet future needs of the industry.

OIL CENTER TOOL COMPANY HOUSTON

O-C-T Products are available through more than 700 supply stores.

WORTHINGTON

POINTERS ON PUMPS

Prepared for Industry by Worthington Pump and Machinery Corporation

A Plan That Gets the Most out of Centrifugal Pumps

Easy-To-Install Maintenance Program Means Better Performance, Longer Life

You can't get maximum production when your equipment's operation is constantly interrupted due to breakdowns. Moreover, today's equipment shortages make it increasingly more important that you get all the life you can out of your present machines.

We'd like to suggest a maintenance plan that will help you get the most out of one of your most vital pieces of equipment—centrifugal pumps.

Keep Informative Records

If you haven't already done so, it's a good idea to begin your maintenance plan by setting up a card index file so that you can catalogue each pump in your plant. Each card should contain the following information: plant pump number, size, manufacturer's name and style, serial number, date installed, and any other data which will help you to rapidly locate repair parts lists and manufacturer's parts numbers.

The rest of the card can be divided into a number of columns: Repair Date, Part Affected, Remarks, and Cost. A typical card is shown here.

PUMP MAINTENANCE CARD

_____ PUMP NO.	_____ MANUFACTURER
_____ SIZE	_____ MFGR'S ADDRESS
_____ DATE INSTALLED	_____ MFGR'S SERIAL NO.
_____ LOCATION	_____ MFGR'S STYLE

DATE	PART	REMARKS	COST

If you're careful to enter every maintenance or repair operation on the proper card, it won't be long before each card indicates a particular pattern of maintenance.

Set Up A Maintenance Schedule

Once this pattern is established for all the cards, you can set up a schedule of maintenance points for such items as: packing, greasing or oiling, painting, gasket replacement, and bearing examination. You may find, for example, that a unit or group requires packing maintenance about once every three months, and greasing once every four to six months, etc.

Your next step is to arrange a plant schedule so that a particular pump may be shut down for maintenance at or before these times. Thus you make it possible to do the maintenance work under proper and unhurried conditions to assure maximum conformity of production consistent with long pump life. In addition, examination of the card catalogue will guide operating and maintenance personnel as to quantity of repair parts they should keep on hand.

Make Periodic Inspections Externally

It is considered *inadvisable* to open pumps for inspection.

Rather, recent practice is to let pumps stay on the line until such time as external symptoms indicate overhaul may be required. These symptoms involve either a reduction in effective capacity because of wear at the internal clearance points or mechanical difficulties, such as vibration or noisy operation.

Parts requiring most frequent replacement in centrifugal pumps are: wearing rings, shaft sleeves, packing and bearings.

The most important maintenance point on process pumping equipment is the stuffing box. It must be kept clean, cool, and lubricated—but *packing* is the crucial operation. A good packing method will be discussed in a later edition of *Pointers on Pumps*.

Don't forget the frames, base plates, and supporting parts of your pumps. Good housekeeping often makes it easier to do a good overall maintenance job!

Can We Help You?

Worthington makes more *standard* pumps than any other manufacturer. Don't buy a "special" (at a higher price) without checking to see if Worthington makes it *standard*.

If you *do* need a special, remember Worthington's modern engineering facilities, backed by the longest and broadest experience in the field. Contact our nearest District Office or write to Worthington Corporation, Centrifugal Pump Division, Harrison, N. J.

C.2.2

The World's Broadest Line Assures You the Right Pump for Every Job

WORTHINGTON
Centrifugal Pumps

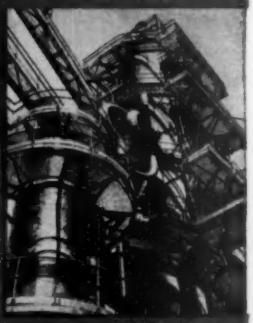
Specify KLEMP

✓ Grating and Stair Treads for Greater Safety

✓ Ganister Lining Reinforcement Meshes for Longer Life

(Above) Thousands of square feet of KLEMP HEXTEEL installed in World's Biggest Catalytic Cracker Unit at this Giant Gulf Oil Refinery in Port Arthur, Texas.

(Below) DIAMOND RIVETED GRATING serves for strong, clean, non-slip, fireproof, ventilated catwalks, mezzanines, stairways and platforms, prefabricated to your most exacting specification. Shown here is a Shell Oil Company installation.



(Above) GANISTER LINING REINFORCED with KLEMP HEXTEEL (shown being welded into a cat cracker) keeps CATALYST REGENERATORS ON LINE Longer. HEXTEEL, when applied, as a reinforcement mesh is filled with a cement filler. This reduces "burn-arounds" to a minimum and helps avoid scouring and abrasive actions of the catalyst which can quickly ruin cat crackers and thermal crackers.

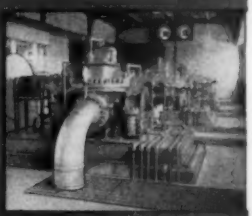
We Tread the World with Safety

The Klemp Metal Grating Corporation has been serving the needs of the Oil Companies for almost Half A Century. During this time Klemp has produced and patented several specialized gratings, such as HEXTEEL® and FLOORSTEEL® reinforcement meshes for use in fractionating vessels for the Oil, Chemical and Petro-Chemical industries.

KLEMP DIAMOND RIVETED and KLEMP KREST WELDED GRATINGS are consistently specified for stair treads, walkways, landings, tower stairs, catwalks, stairways and many other applications.

We are the only grating company to do all of our own work and we have complete fabricating facilities from complicated radial "set-ups", down to simple runs. Our engineers have spent a lifetime in this business and their specialized experience is at your service. We solicit the opportunity to solve your most difficult grating problems.

(Below) NEW KLEMP KREST® WELDED GRATINGS are made from special steel bars so formed to provide a peak or krest on the top side of the bar which gives this type of grating maximum non-slip characteristics. Ideal for structural foot walks as well as all other universal uses.



(Above) KLEMP FLOORSTEEL, because of its greater flexibility, is used to line the pipes leading to and from the catalyst regenerator. FLOORSTEEL is ideal for silencer stack units and also protects the narrow throat of the catalyst regenerator.

Write for Klemp's two new, free, fully illustrated technical catalogs, titled—

KLEMP 4 "Grates" serving the Nation's Major Oil Companies

KLEMP Open Steel Grating And Stair Treads

(Below) Klemp Manufactured, Diamond Riveted, Welded and Serrated Stair Treads. This Serrated Tread has been developed especially for installations where unusual precautions are necessary to avoid accidents resulting from grease, mud, snow, etc.

Mr. Louis R. Turbeville
Consolidated Sales Agency
Dallas 2, Texas

Mr. W. V. C. Jackson
Tulsa, Oklahoma

Mr. H. L. Thompson
H. L. Thompson Co.
Houston, Texas

Mr. C. G. Ehlinger
Campbell Steel Co.
San Antonio, Texas

Mr. W. K. Ramsey
Ramsey Steel Company
El Paso, Texas

Mr. C. R. Ball
Ball & Black Supply Co.
Los Angeles 23, Calif.

KLEMP

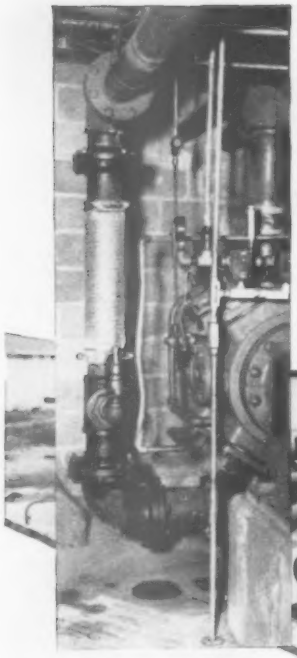
KLEMP METAL GRATING CORPORATION

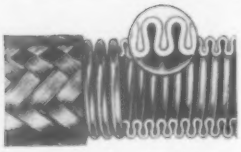
®Trademark

Here's the

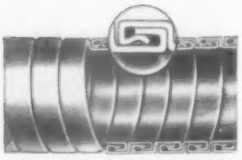
ECONOMICAL WAY

to keep vibration out of rigid piping . . .





CMH corrugated steel and bronze hose is available in standard sizes from 3/16" through 14" I.D. for burst pressures to 12,000 psi, temperatures to 1000° F. Stainless steel types also available.



CMH convoluted hose is available for lower pressure applications in a variety of types including square locked, ball bearing and fully interlocked . . . in steel, bronze and other alloys. Sizes up to 12" I.D.

CMH FLEXIBLE METAL HOSE

Isolation of vibration is easy and economical when you use CMH Metal Hose to connect rigid piping to machinery. Metal hose assemblies are quickly installed, just like a length of pipe. The flexibility of the unit effectively absorbs vibration while the all-metal construction assures long, dependable service. If you have a vibration problem in your piping it will pay you to consider CMH Flexible Metal Hose. Your Flexonics distributor can give you full information. Look for his name in your classified telephone directory.

CHICAGO METAL HOSE Division

Flexon identifies CMH products that have served industry for over 50 years.

CMH

Flexonics Corporation 1345 South Third Avenue, Maywood, Illinois

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Flexible metal hose

Expansion joints

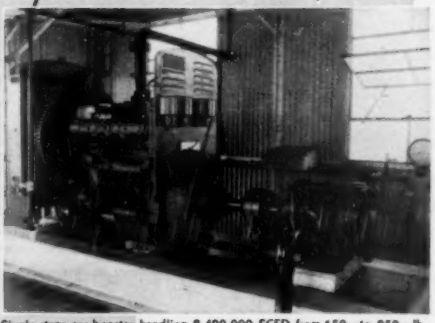
Aircraft components

Metallic bellows

Five two-stage gas boosters, each handling 1,770,000 SCFD from 10—to 120—psig, at 800 rpm, direct connected to V-12 Climax gas engines.

FULLER ROTARY COMPRESSORS

Single-stage gas booster handling 3,560,000 SCFD from 15—to 45—psig, driven by V-12 Climax gas engine through gear speed reducer.



Single-stage gas booster handling 2,400,000 SCFD from 150—to 250—lb. psig, at 870 rpm, direct connected to Waukesha gas engine.

Oilmen in Texas invest in the FULLER ROTARY COMPRESSOR

Fuller compressors are available in a range of cylinders up to 3300 c.f.m. (at atmospheric intake) at normal speeds, with a reasonable variation in speed range—motor, engine, or turbine drive.

For extra gas boosting to plant or trunk level, Fuller Rotary Compressors can be spotted along gathering or supply lines where they operate efficiently, under the most adverse conditions, without constant supervision.

Fuller Compressors require little maintenance because only the rotor, blades and bearings move. No valves to leak or seats to grind. Blades automatically compensate for wear . . . maintained capacity for the life of the machine. Pulsations and vibrations are reduced to a minimum. For the most efficient, economical way to boost pressures, install the Fuller Rotary Compressor. Write for Bulletin C-6, now.

Fuller

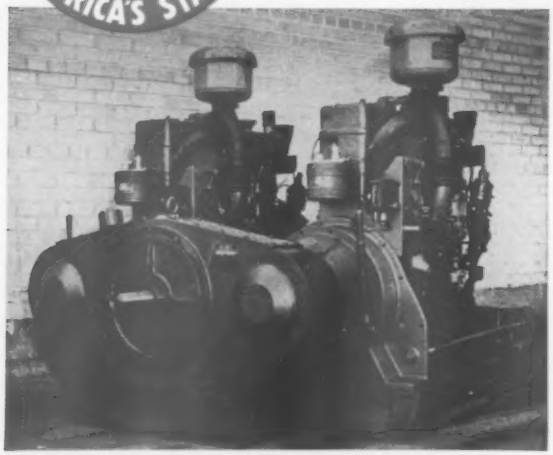
FULLER COMPANY, Catasauqua, Pa.
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

PIONEERS OF HIGH-EFFICIENCY VANE-TYPE ROTARY COMPRESSORS

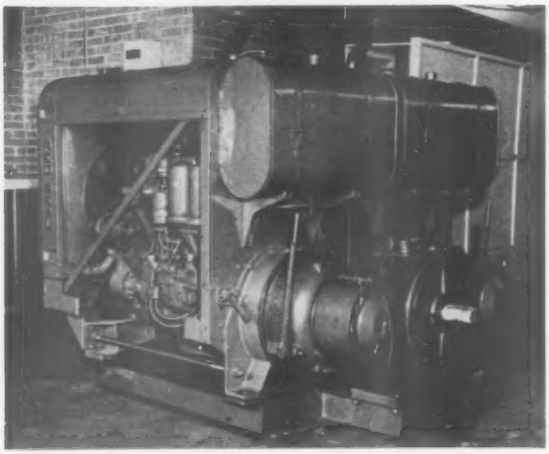
C-226

RED SEALS are Fast Becoming

No. 1 CHOICE for the OIL FIELD



Continental 33R's as compounded for oil field use. Dual unit delivers all but approximately 2% of the full output of its two component engines.



Continental RD-572 Diesel closed power unit, compounded version. Other Red Seal models adapted to compounding include the 427, 501 and 602 Series.

Thanks partly to Continental Motors' heavy emphasis on ENGINEERING, and partly to the steady broadening of its line, there are more and better reasons today than ever before for standardizing on Red Seals when choosing oil field power. Such features as Continental's exclusive individual porting, sodium-filled and stellite-faced exhaust valves with positive rotation, full-length water jacketing, Tocco-hardened crankshaft journals, and removable tappets, are only a few of the many advances which combine in Continental to assure top performance, dependability, and long life.

Compounding of identical units is coming into wider and wider use where the need is for power beyond the Continental single-engine range. The resultant power source is comparable in cost with a single engine of equivalent output, but service expense—especially parts replacement—runs substantially lower, and these upkeep savings pyramid over the years.

THERE ARE OIL FIELD MODELS FOR USE ON ALL STANDARD FUELS – GASOLINE, DIESEL OIL, BUTANE, PROPANE – AND THEY'RE BACKED BY SERVICE AND GENUINE PARTS FROM COAST TO COAST.

Continental Motors Corporation

MUSKEGON, MICHIGAN

6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIFORNIA

IT'S A NEW KIND OF TRUCK!

The Autocar V/8

One of the first V/8s has been delivered to Couch Motor Lines where its performance, economy and extra load-carrying capacity are fulfilling every expectation. The Autocar V/8 is now also available in 4 and in 6-wheel trucks.

You'll like the way Autocar engineers have combined high power with low weight. The V/8 valve-in-head engine develops better than 200 horsepower. It gives you V/8 smoothness and a margin of power that handles any road or load more easily than ever before. And the chassis saves hundreds of pounds in weight without sacrifice of sturdiness. See it at your Autocar branch or write today for the Autocar V/8 booklet.

AUTOCAR TRUCKS THE AUTOCAR COMPANY, ARDMORE, PA.
Established 1897

198

CLIP AND MAIL TODAY!

The Autocar Company, Ardmore, Pa.
The Autocar V/8 sounds good to me. Please send me the booklet.

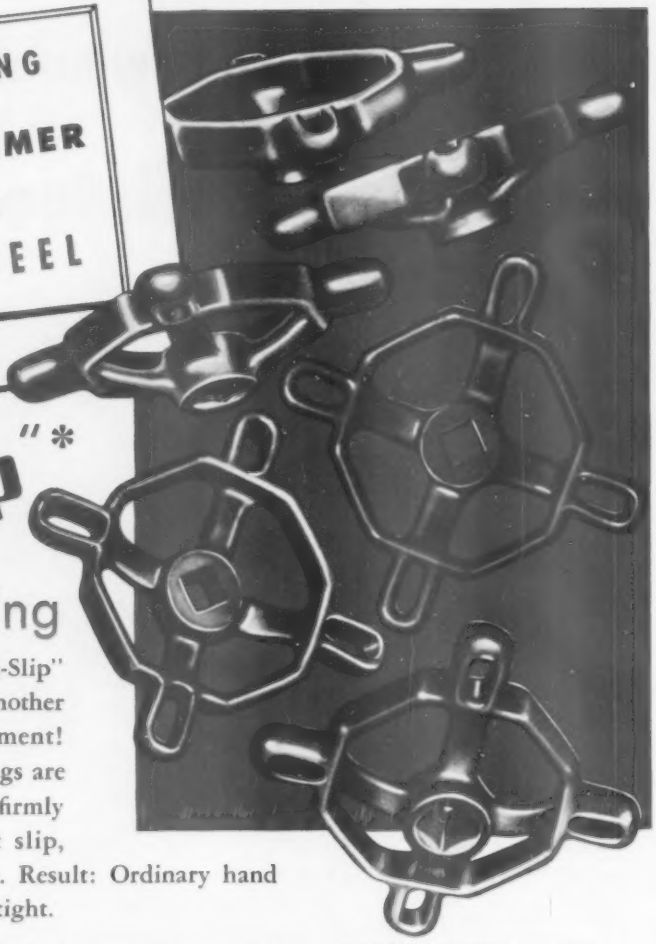
Name_____

Company name_____

Address_____

Number of trucks in fleet_____

ANNOUNCING
THE NEW
LUNKENHEIMER
VALVE
HANDWHEEL



"non-slip"*
for
positive closing

This revolutionary "Non-Slip" Handwheel introduces another Lunkenheimer improvement! Four rounded, non-slip lugs are gripped comfortably and firmly —operator's hand can't slip, even when wet or greasy. Result: Ordinary hand leverage closes the valve tight.

The new "Non-Slip" Handwheel is cooler, too—and keeps the operator's hand away from the top of the stem, which may be hot. It's sturdier, easier to operate, and makes your valves last longer.

*Patent Pending

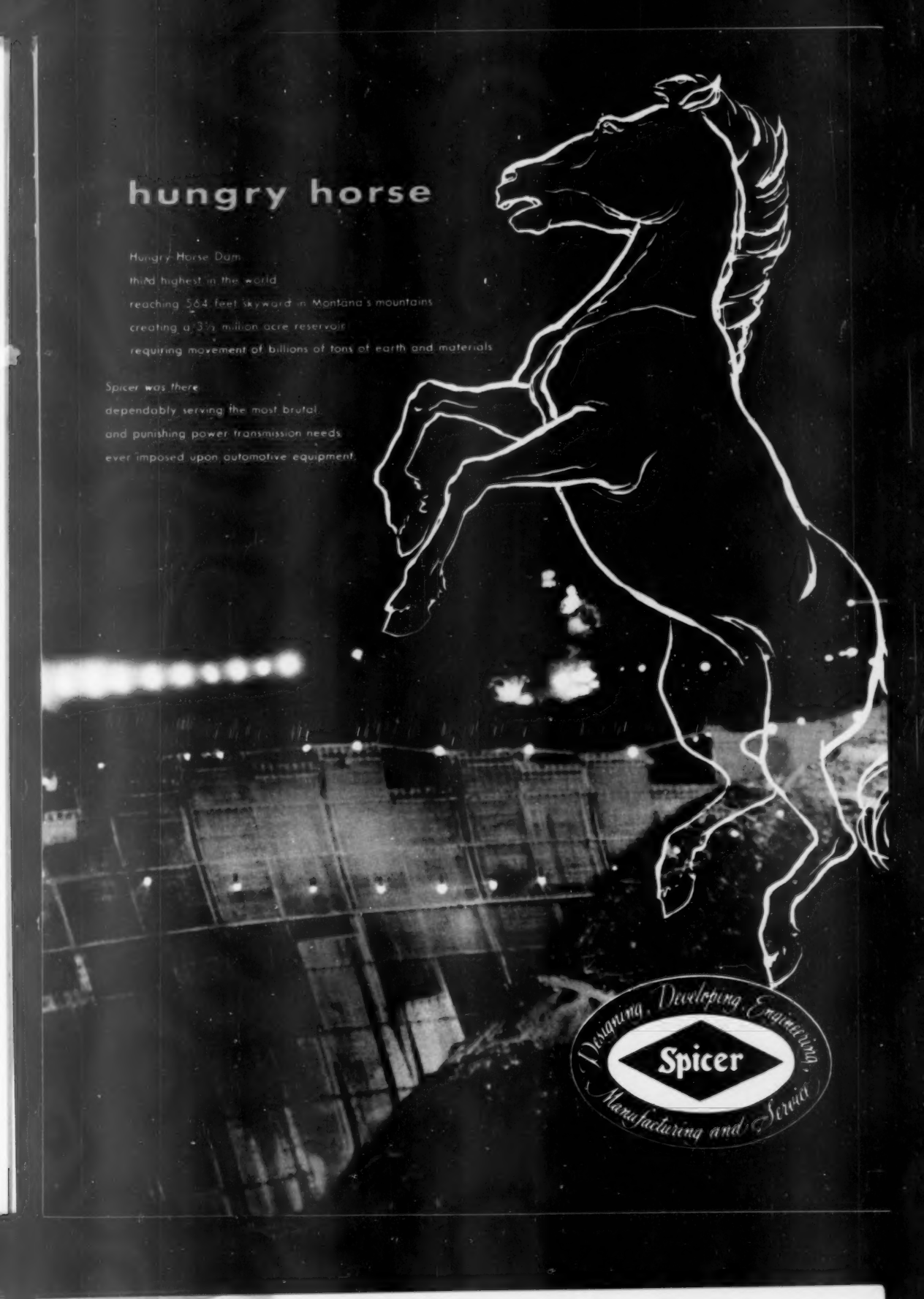
WRITE FOR the name of your nearest Lunkenheimer distributor. He can show you samples of Lunkenheimer Valves with the new "Non-Slip" Handwheel. See them for yourself — *test them.* The Lunkenheimer Company, Box 360F, Cincinnati 14, Ohio.

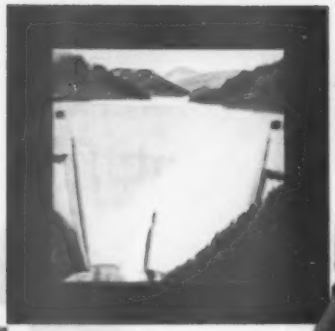
BRONZE • IRON • STEEL

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-152-23


hungry horse
Hungry Horse Dam
third highest in the world
reaching 564 feet skyward in Montana's mountains
creating a 3½ million acre reservoir
requiring movement of billions of tons of earth and materials
Spicer was there
dependably serving the most brutal
and punishing power transmission needs
ever imposed upon automotive equipment
Designing, Developing, Engineering,
Spicer
Manufacturing and Service



hungry for horsepower

Biggest in the world are Boulder . . . Shasta . . . Hungry Horse . . . Grand Coulee . . . Ross . . . and other great American water-impounding structures.

Their demands for construction horsepower were stupendous. And adequately met by the automotive industry's designing and manufacturing genius. In all kinds of motive power units used for these immense dam-building jobs, Spicer Universal Joints, Clutches and Transmissions helped to complete time schedules that were *hungry for horsepower.*

Spicer—Standard of the Industry

SPICER MANUFACTURING DIVISION *of Dana Corporation*
TOLEDO 1, OHIO

49 YEARS OF Spicer SERVICE

ENGINEERING
DANA
MANUFACTURING

We Endorse the Junior Achievement Program

TRANSMISSIONS • UNIVERSAL JOINTS • BROWN-LIPE AND AUBURN CLUTCHES • FORGINGS • PASSENGER CAR AXLES • STAMPINGS • SPICER "BROWN-LIPE" GEAR BOXES • PARISH FRAMES • TORQUE CONVERTERS • POWER TAKE-OFFS • POWER TAKE-OFF JOINTS • RAIL CAR DRIVES • RAILWAY GENERATOR DRIVES

Takes any job you give it

genuine CUTLER-HAMMER

"Oil Country"

WELL PUMPING CONTROL

built for any operating conditions

Cutler-Hammer 9589 oil well pumping controller with 3 coil overloads and time delay relay.

Cutler-Hammer Program Time Switch gives automatically scheduled pumping, set up easily by means of pull tabs—one for each 15 minute interval.

Day-omission feature—for non-operation any selected days of week.

You never see a cover door propped open to keep Cutler-Hammer Oil Well Pumping Control working . . . because the enclosure is adequately ventilated with four screened protected louvres and provided with a heat reflecting aluminum finish.

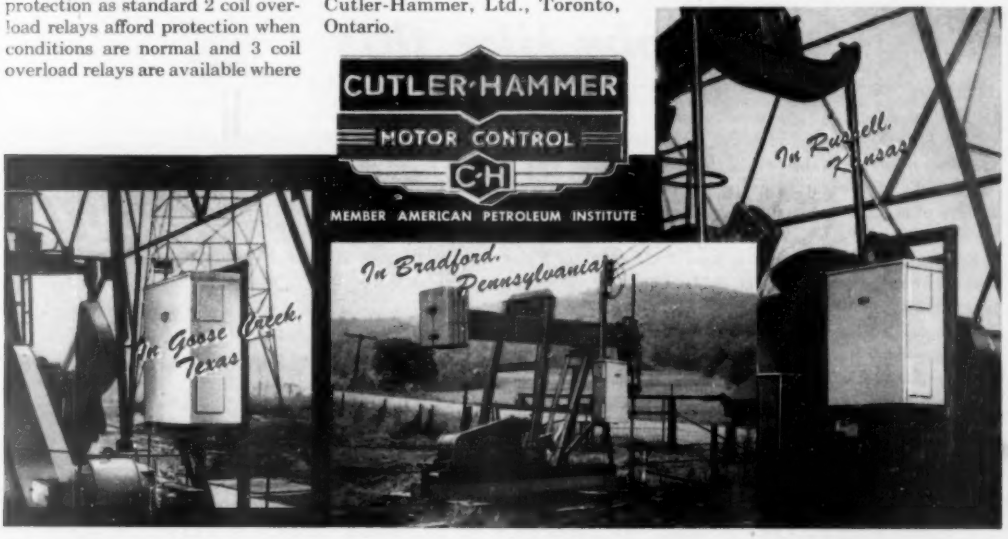
You never have to worry about this control in dusty, insect-infested country, because the famous Cutler-Hammer Vertical Contacts shed dust, the timer is neoprene-gasketed and the clock motor has excess torque.

You can have manual restarting or automatic time-delay staggered restarting, or automatic instantaneous restarting. And you can change from one to another easily.

You need not worry about motor protection as standard 2 coil overload relays afford protection when conditions are normal and 3 coil overload relays are available where single phasing is a common occurrence. You can change the time scheduling easily; just pull out small, convenient tabs. You can have an automatic day-omission feature. You don't have to clean up or rebuild the starter after a lightning arrester blows, and this unit type tells at a glance which is blown.

These are just some of the features that make Cutler-Hammer the genuine "Oil Country" Control. Try it and see what performance really is. It has been proved everywhere, on the Gulf, in the Panhandle, in the dry and arid country, in the middle west and in the east. CUTLER-HAMMER, Inc., 1453 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.

CUTLER-HAMMER
MOTOR CONTROL
C-H
MEMBER AMERICAN PETROLEUM INSTITUTE



You use the world's best paint on jobs like this

Of the $65,000 spent to paint this great bridge, less than a third was the cost of the paint itself. That's why it is economical to use the best quality aluminum paint that adds extra years between repaintings.

So much aluminum paint is used for metal and masonry surfaces that special formulas have been developed. Paints made to these formulas last longer, protect better under heat, cold, sun, rain, smoke and fumes.

If you have plants, structures or equipment that need paint, it will pay you to find out more about the kinds of aluminum paints now available. We do not make paint. But, as the leading suppliers of aluminum pigments to paint manufacturers, we want you to get the best results from the aluminum paint you buy.

Write us about your paint problems and we'll tell you what type of aluminum paint to use. We'll also send you a copy of *Painting with Aluminum*. It is packed with facts and answers to all types of industrial painting questions. Write Paint Service Bureau, Aluminum Company of America, 1791-B Alcoa Bldg., Pittsburgh 19, Pa.

Alcoa Aluminum

ALUMINUM COMPANY OF AMERICA

PIPE LINE PROGRESS

26-inch for Texas Gas Transmission Line

It was in 1950 that Texas Gas Transmission Corporation completed construction of a new, large-diameter natural gas transmission system. It transports gas from Louisiana and Texas reserves to customers in Arkansas, Mississippi, Tennessee, Kentucky, Indiana, Illinois and Ohio.

Additional pipe was lowered in during 1951 to provide increased capacity through looping and extension, lines that will be completed in 1952. These will increase natural gas deliveries to Texas Gas Transmission customers in all these states.

A. O. Smith's contribution to this great addition to the major gas transmission systems of the nation has been shipment of more than 1,300 miles of 26-inch, 20-inch and 16-inch diameter pipe. They were delivered to meet construction requirements for the main line, looping, extensions and some river crossings.

Our welded steel line pipe, internally expanded and accurately sized, constitute a large part of the petroleum and gas transmission lines on this continent. Through the years, A. O. Smith capacity has met the challenge of rapidly expanding pipeline systems that now crisscross America.

A. O. Smith Line Pipe is available in a complete range of sizes and wall thicknesses, from 8⅝-in. to 36-in. diameters.

FIRSTS by A. O. Smith: Welded line pipe • Internally expanded pipe • Light-wall large-diameter pipe • World's largest producer of large-diameter welded steel pipe.

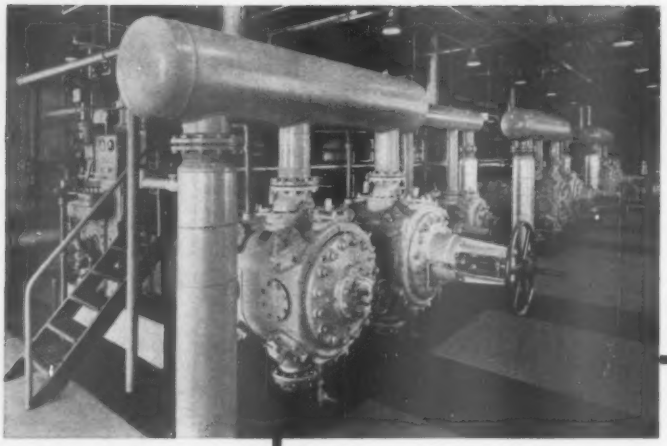
The A.O.Smith Casing Mill is operating at capacity to supply vitally needed casing for the Oil and Gas Industry.

A.O.Smith

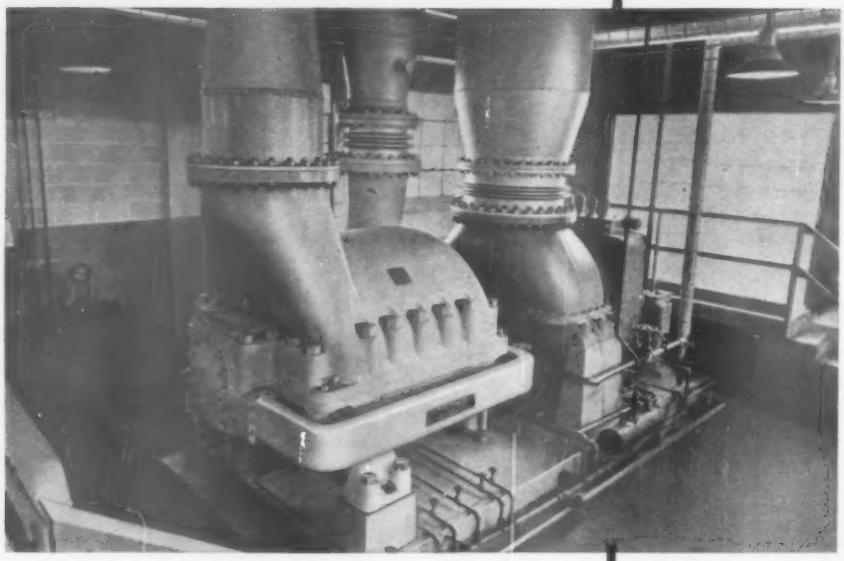
LINE PIPE • CASING

Chicago 4 • Dallas 2 • Denver 2 • Houston 2
Los Angeles 22 • Midland 5, Texas • New Orleans 12
New York 17 • Pittsburgh 19 • San Francisco 4
Seattle 1 • Tulsa 3 • Washington 6, D.C.
International Division: Milwaukee 1

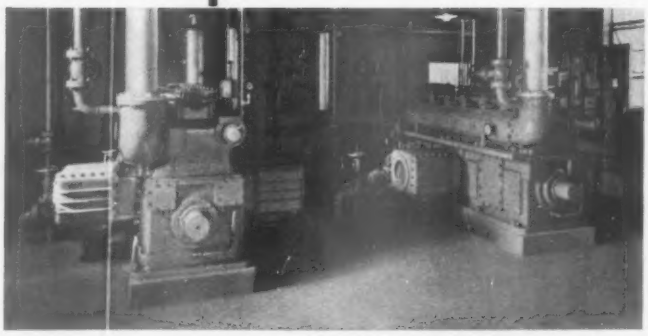
DEPENDABILITY THROUGH RESEARCH AND ENGINEERING



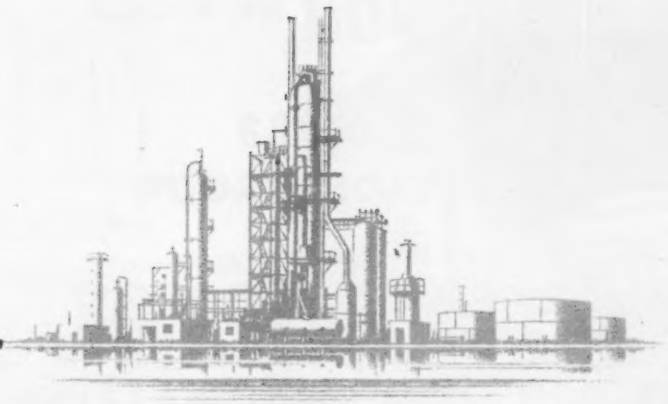
Three Clark 660 bhp HRA-6 "Right Angle" Gas-Engine-Driven Compressors used in vapor recovery service.



Clark No. 4 Multi-Stage Centrifugal Compressor, driven by 2500 hp steam turbine, furnishing air for catalyst regeneration.



Two Clark 225 bhp HMA-6 Gas Engines driving vertical water pumps.



another Clark exclusive

in Canada's booming oil industry

British American solves all compressor requirements with Clark "Centrifugals" and "Right Angles" in Saskatchewan's first cat cracker

With the recent completion of Saskatchewan's first catalytic cracking unit, Clark compressors again play an important role in Canadian refinery progress.

In this 9000 bbl. per day addition to the British American Oil Company's Moose Jaw Refinery, pressure-volume conditions dictated the use of both centrifugal and reciprocating compressors:

To meet the air requirements, a Clark No. 4 Multi-Stage Centrifugal Compressor was chosen. High capacity, low discharge pressures and the availability of process steam made this unit the most advantageous, economically and process-wise.

To handle vapor recovery requirements, 3 Clark 660 bhp "Right Angle" Compressors were chosen. High discharge pressures, moderate capacity and the need for flexibility made them the most logical choice. (In addition, two Clark HMA-6 Gas Engines are driving water pumps for the refinery's water system.)

The advantages gained through the use of both centrifugal and reciprocating compressors, in certain applications, can be substantial. That's one of the big reasons why the trend is to equip with Clark compressors exclusively. Clark builds *both*. Clark builds *all* types. You are *always* assured of completely unbiased recommendations.

CLARK BROS. CO. • OLEAN, N. Y.

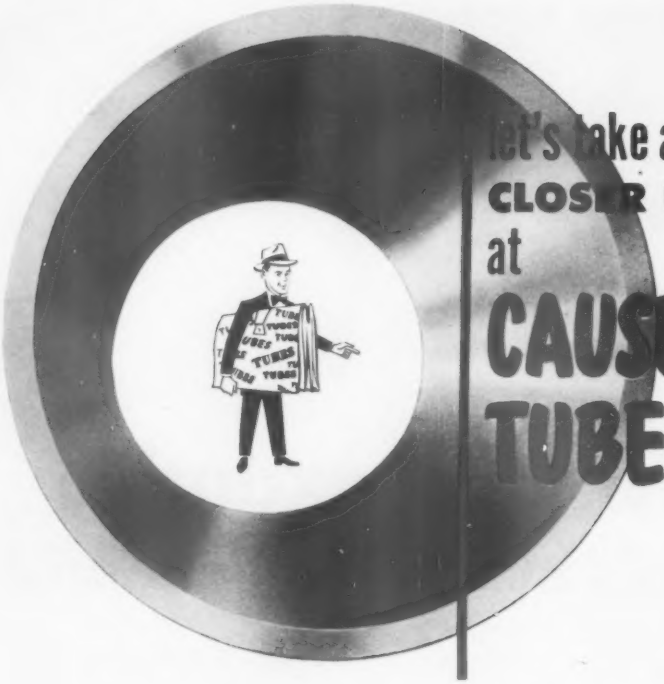
Division of Dresser Operations, Inc.

OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

PRECISION BY THE TON

CLARK compressors

MOTOR DRIVEN • GAS, STEAM OR DIESEL ENGINE DRIVEN • CENTRIFUGAL • AXIAL FLOW



let's take a CLOSER LOOK at CAUSES OF TUBE FAILURES

Tubes are critical materials. Peak production of petroleum products is vital to the defense program. These are two urgent reasons for giving extraordinary attention *now* to getting optimum failure-free service from tube installations in petro-chemical facilities.

Of major importance in securing best operating results is an understanding of the numerous factors affecting tube life in high pressure, high temperature applications. Innumerable investigations of tube failures in such service over a 25-year period show that they are most frequently caused by circumstances other than actual physical defects in the tubes themselves. By far the most common causes of failures are overheating, excessive pressures, corrosion, and scaling due to tubes being subjected to improper operating conditions.

Enumerated are some of the more prevalent reasons, based on extensive studies, that account for excessive tube temperatures and attendant failures in chemical and petroleum conversion equipment. These are presented in the hope they will aid engineers and operating personnel to get better-than-ever service from their tube installations.

Through Mr. Tubes—your local B&W Tube Representative—is available a wealth of data on the behavior of tubing steels under conditions embraced in modern processing plants. It may pay you as it has so many others to call on this vast source of useful information.

Some Common Causes of Reduced Tube Life and Increased Maintenance

1. Excessive transfer rates in furnace equipment.
2. Coking of tubes — either expected or extraordinary.
3. Failure to clean tubes at regularly scheduled periods.
4. Unexpected radiation from bridge wall or refractory surfaces.
5. Improperly calibrated fuel meters on burner equipment.
6. Increase of product temperature over a safe design limit.
7. Unequal heating around circumference or along tube length.
8. Excessive furnace temperatures.
9. Guessing at tube metal temperatures.
10. Increase of pump pressure of maintain through-put.
11. Abuse during mechanical decoking, or scaling during burningout operations.
12. Improper supports resulting in bending or sagging.
13. Lack of control of furnace atmosphere to retard scaling.
14. Corrosion of ends or body of tube or both.
15. Carburization and exfoliation of carburized layer.
16. Abrasion or erosion due to coke in fluid stream.
17. Leaky header seats.

Bulletin TR-516 entitled "Some Experiences in Service", contains more detailed information on this timely subject, and is available upon request.

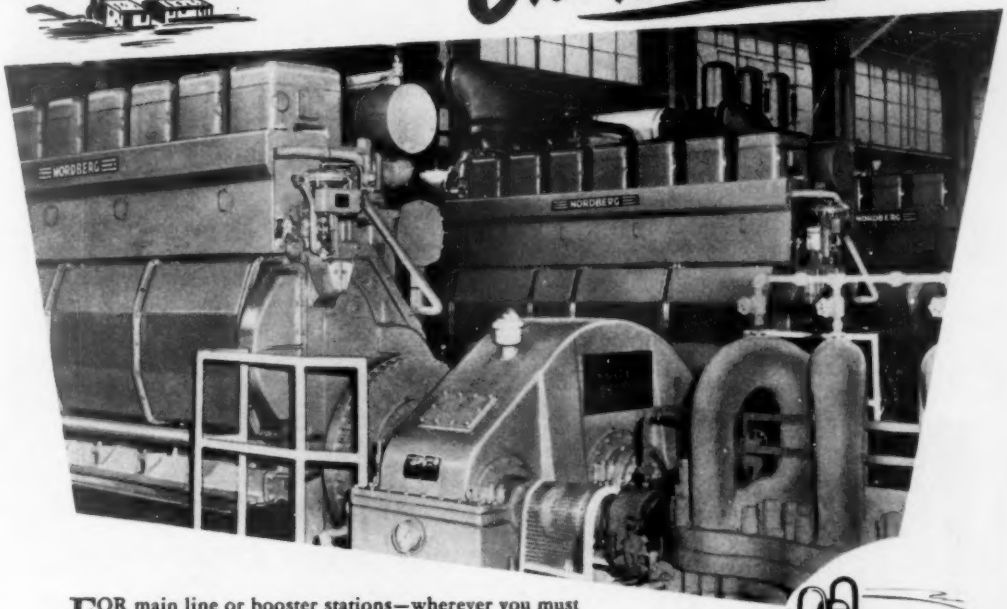
THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices & Plants
Beaver Fall, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver 4, Colo. • Detroit 26, Mich. • Houston 19, Texas • Los Angeles 17, Cal. • New York 16, N. Y. Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. • Toronto, Ontario Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA 1737(P)

Count on NORDBERG ENGINES to keep crude and products "On the move"

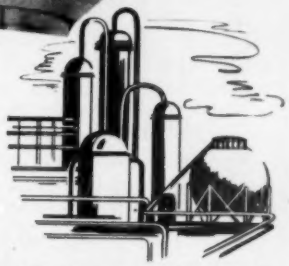


FOR main line or booster stations—wherever you must keep crude and products on the move with plenty of power—you can count on Nordberg engines of the right size and type to do a dependable, economical job, day-in, day-out.

Scores of these rugged engines built by Nordberg and its Busch-Sulzer Division have been proved in over 25 years of pipe line service. Applications range from self-contained portable pumping units to permanent stationary installations, and generating units for station power and lighting.

Nordberg engines are available in a wide range of sizes from 10 to over 10,000 hp, including 2 and 4-cycle types, and in Diesel, Duafuel®, and Spark-Fired Gas models. *Write for further details, outlining your power requirements.*

Nordberg Mfg. Co., Milwaukee, Wisconsin



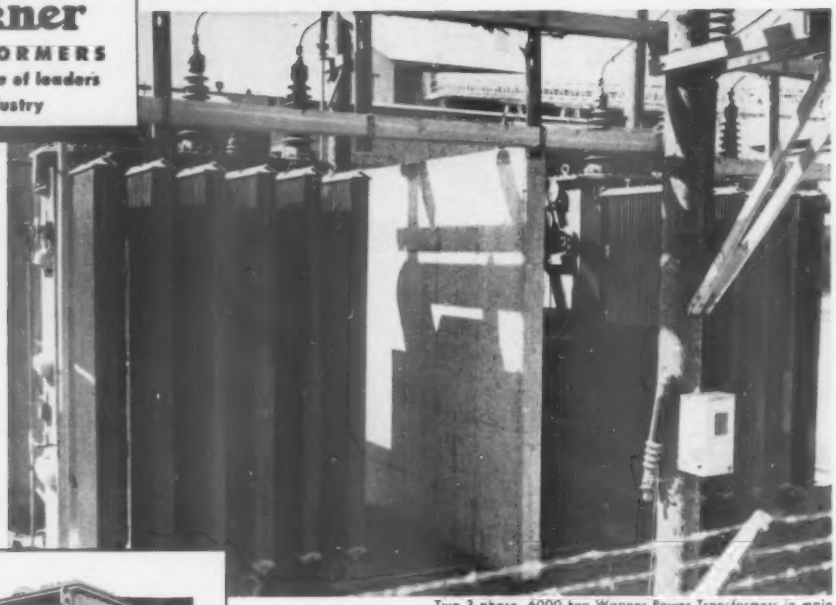
Shown above are three of six 1050 hp Nordberg Duafuel® Engines installed in Richfield pipe line stations in California, designed to operate on natural gas plus Cuyama Crude as pilot oil, on straight Cuyama Crude, or with any proportion of either fuel. Instantaneous conversion from one fuel to another allows the most economical fuel to be used.

NORDBERG

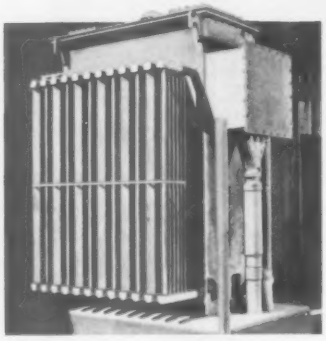
DIESEL • DUAFUEL® AND SPARK-FIRED GAS ENGINES

0251-R2

Wagner
TRANSFORMERS
... the choice of leaders in industry



Two 3-phase, 6000 kva Wagner Power Transformers in main substation — Missouri Portland Cement Company, St. Louis.



ONE OF FIVE Wagner 3-phase, non-inflammable liquid filled unit substation transformers used in this installation. Each transformer is rated 750 kva, 2400 to 480 volts, 60 cycle.

Wagner Power Transformers meet ASA C57 standards

Now, you can simplify your specifications and gain the advantages of improved design at reduced cost by ordering *standardized* Wagner Power Transformers. Wagner Transformers meet all ASA C57 standards for voltage ratings, taps, impedances and both standard and optional mechanical features. Get full information from your nearby Wagner engineer, or write us.

Wagner Transformers selected for modernized distribution system in midwest cement plant

The modernized Prospect Hill plant of the Missouri Portland Cement Company provides a fine example of an up to date distribution system in an application where considerable amounts of power are utilized at primary voltages. 12,000 kva of transformer capacity was required for connected and demand loads, with provisions for a 33 percent increase in capacity for future expansion.

Two Wagner 3-phase power transformers, each rated 6000 kva, with an ultimate of 8000 kva to be obtained with the addition of cooling fans, were used to meet this requirement for the main substation.

The distribution system uses five 750 kva unit substations, each located as close as possible to the load centers they serve. These substations are powered by 3-phase Wagner unit substation transformers, each with identical specifications.

Wagner transformers were chosen for this installation, as they are for a great many industrial and power company installations, because of their ability to give continuous service over unusually long periods of time. Consult a Wagner engineer on your next transformer installation, or write for Bulletins TU-180 and TU-181 for full information.

WAGNER ELECTRIC CORPORATION
6389 Plymouth Ave., St. Louis 14, Mo., U.S.A.

® Wagner Electric Corporation EST. 1891

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

T53-6

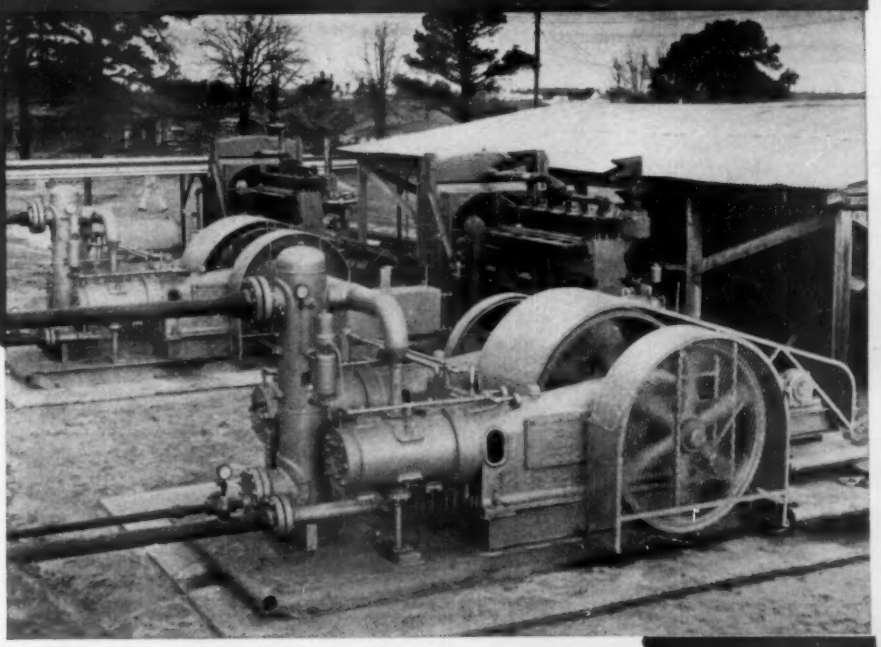
Boost Production

with GARDNER-DENVER

Booster Compressors

For ducking mom has possessed ... for intensifying, reprocessing or oxygen lift.

Bulletin BC-1 describes 17 typical installations. Write for your copy today.



Since 1859

GARDNER-DENVER

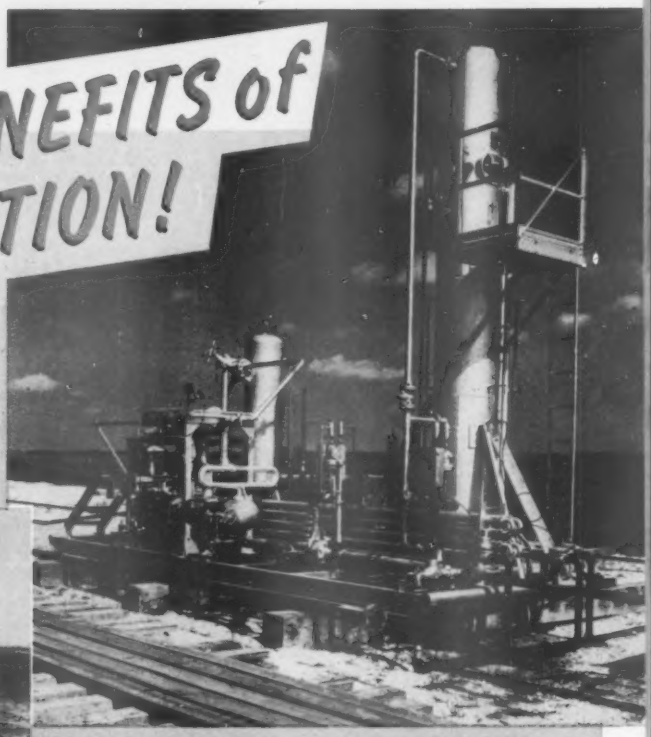
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd.,
14 Curity Ave., Toronto 13, Ontario

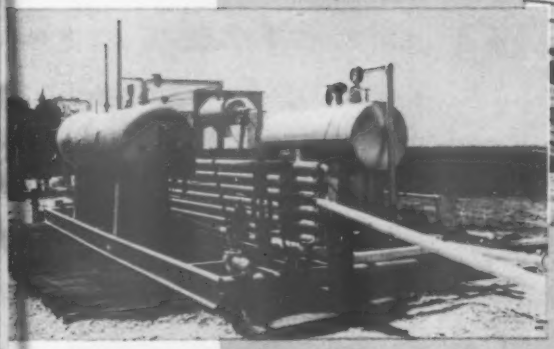
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

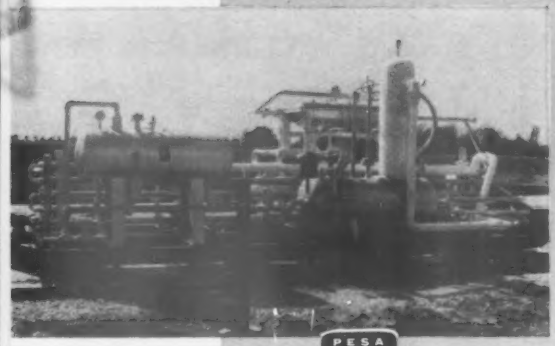
PARKERSBURG HYRECO Gas Processing Units

Give You . . .

MAXIMUM BENEFITS of COLD SEPARATION!







● To obtain maximum benefits of cold separation requires equipment that can be applied, without compromise, to every gas producing condition. Only Parkersburg's wide range of Hyreco Gas Processing Units provide this extreme flexibility.

For normal gas processing installations Hyreco Units are equipped with the Hydracepter Liquid Knockout. Where water-oil emulsions form in the liquid valve a special Hydracepter Water Knockout can be supplied and emulsion prevented. Where emulsion must be combatted concurrent with uncurtailed temperature reduction, a combination liquid and water knockout operation can be provided. Where sand or sediment conditions exist, Hyreco can be equipped with a vertical liquid knockout.

In addition, Hyreco Units are available in either T-Type or Horizontal high recovery separator design. Capacities range from 2,000 MCF up to 20,000 MCF per day normal readings, with larger units available on special order.

Don't compromise with maximum efficiency. Talk to your Parkersburg Representative about your gas producing problem and the Hyreco Unit best suited to your conditions.

PESA

No. 5302

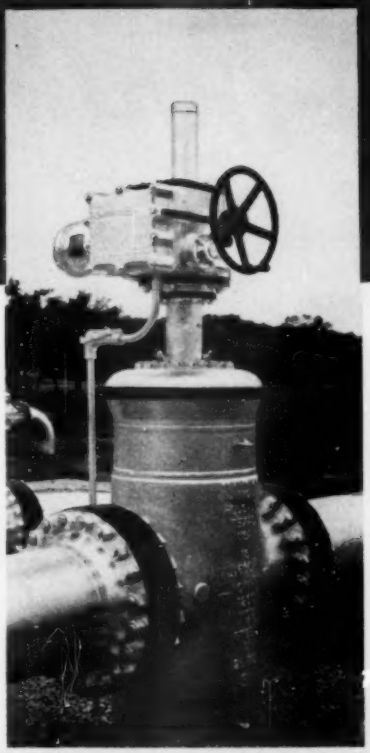
PARKERSBURG
PRESSURE EQUIPMENT

HORIZONTAL AND VERTICAL SEPARATORS • HYRECO • HYDRACEPTER • SCRUBBERS • TREATERS • HEATERS

Manufactured in Houston, Texas

LIMITORQUE®

...the most widely used AUTOMATIC VALVE OPERATOR in the world



In all parts of the world, thousands of LimiTorque Controls are used for automatic or remote operation of valves of all types. These are in daily service on many of the most successfully operated petroleum and gas pipe lines and in numerous well known refineries.

LimiTorque Controls provide a dependable means of operating valves quickly from a central or remote control station. Many distinctive construction features are built into LimiTorque for safe, sure opening and closing of valves of all types. Electricity, air, water or gas can be used for actuation. On many pipe lines the high pressure gas in the line is used.

Your valve manufacturer can supply LimiTorque.

Our catalog L-50 illustrates and describes the Limitorque Valve operators. Write for a copy on your Business Letterhead.

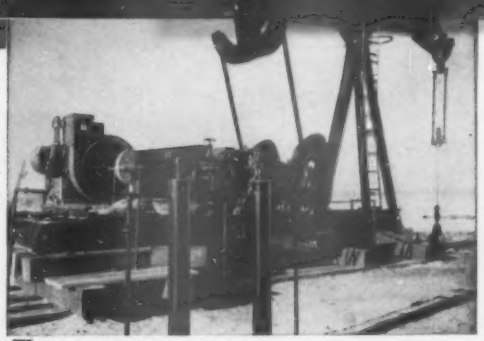
Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

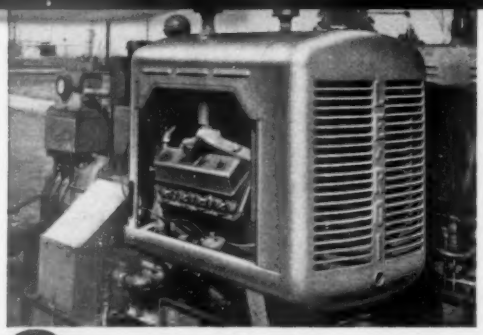
Industrial Gears and Speed Reducers
LimiTorque Valve Controls

Le Roi 3 way Partnership



1 Better Engines. An example is the modern Le Roi A288 well-pumping engine located at a major oil company's lease in Oklahoma City. This engine has run 282,952 HP-hours at about one half the cost per HP-hour the company considers a good average. That's typical of Le Roi's progressive design policy to meet your problems.

24-hour-a-day



2 Better Applications. Exclusive Le Roi distributors and factory men are oil-field power specialists. They know engines and how to recommend best operating speeds and accessory combinations to give you low-cost, lasting power.

3 Better Service. Keeping your Le Roi engines running is the sole responsibility of our distributors and Tulsa branch-office staff. Parts on hand when you need them, top-notch service men on 24-hour call, and unexcelled overhaul facilities assure your getting the most out of Le Roi oil field engines.

service for 5 years

in sour gas...never overhauled

That's Le Roi performance at this pipeline booster station, under most difficult operating conditions in district

And Le Roi's are still going strong — pumping 27,000 barrels daily, to hold 1,000 psi line pressure.

At this booster station — owned by a major pipeline company — the top-notch performance of one Le Roi F1500 led to the purchase of two more F1500's and two Le Roi L3000's.

Though one of these engines is now almost five years old, none have needed overhauling to date — and only very little maintenance has been required. This trouble-free performance has been achieved in spite of unfavorable conditions — dust, heat, and corrosive sour gas.

Because Le Roi's help keep operating expenses to a minimum, installations are being made for pipeline and other oil-field service in an ever-increasing number.

No matter what your engine application, it pays you to find out about Le Roi oil-field power from your nearby Le Roi distributor or supply house. They can show you Le Roi engines at work under conditions similar to yours, and explain the benefits of Le Roi's 3-way partnership.

LE ROI

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN
Plants: Milwaukee • Cleveland • Greenwich, Ohio
Oil Field Headquarters: Tulsa, Oklahoma

See these Le Roi Distributors for a Profitable 3-way Partnership

Oklahoma
Le Roi Company Branch — Tulsa
Carson Machine & Supply Co.— Oklahoma City

East & South Texas, Gulf Coast
Southern Engine and Pump Company — Houston, Kilgore, Edinburg, Dallas, San Antonio, Corpus Christi, Texas, and Lafayette, Houma, Louisiana.

North & West Texas, New Mexico
General Machine & Supply Co. — Odessa, Snyder, Texas.
Nortex Engine & Equipment Co.—Wichita Falls, Texas.

Kansas
Carson Machine and Supply Co.—Great Bend

Illinois — Western Kentucky
Western Machinery & Engine Company—Centralia, Illinois and St. Louis, Missouri.

Michigan
Hofer Engine Service — Reed City

Rocky Mountain Area
Gehring Equipment Co. — Casper, Wyoming, Rangeley, Col.

Northern Louisiana & Mississippi
Ingersoll Corporation — Shreveport, Louisiana, and Jackson, Mississippi.

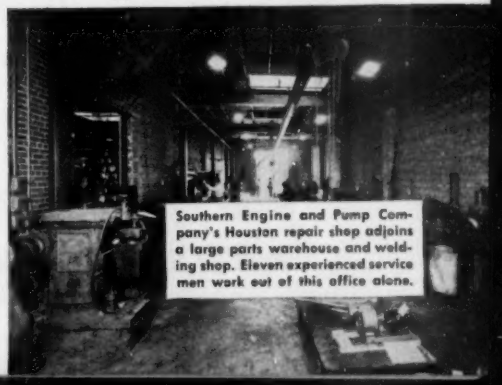
West Coast
Le Roi-Rix Machinery Co. — Los Angeles, Long Beach and Bakersfield, Calif.

Appalachian Area
P. C. McKenzie Co., Pittsburgh, Bradford.

Canada
Lucey Export Ltd. — Calgary, Edmonton, Alberta.

P-113

Typical LE ROI service facility



Southern Engine and Pump Company's Houston repair shop adjoins a large parts warehouse and welding shop. Eleven experienced service men work out of this office alone.

FWD light-duty Model LD offers all these outstanding features that help you

handle more jobs

The FWD light-duty LD makes an ideal explosives or water carrier, drill or communications truck.

Proper Weight Distribution Only a true 4x4 gives you up to 40% of the weight on the front wheels. This gives you the extra traction needed to work in any footing, any weather.

A Leader for Geophysical Service The LD is the answer for work which conversions and conventional trucks have long sought to do. As a water carrier it makes more trips daily, as a drill truck it reaches more locations, drills more holes daily. Can also be equipped as a shooting or recording truck, or to haul equipment and supplies.

Real Truck Engine—Real Truck Parts The FWD LD is designed and built for rugged use ... pays off in more productive time, fewer breakdowns in field.

High-Climb Oil Sump Keeps oil pump constantly submerged. An FWD exclusive that lets you drill holes on the steepest grades.

For the hundreds of assignments in and around the fields or along the pipelines that require a small, economical, *go-anywhere* truck . . . this light-duty LD has no equal.

Only FWD-built trucks offer so many features that provide *your crews* with a versatile, dependable rig. Only FWD-built trucks have so many advantages which contribute to operating economy and longer, trouble-free service that give you top value for your equipment dollar.

For all the facts, see your FWD Dealer or write direct.

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wis. *Canadian Factory*: Kitchener, Ont.

Built by the makers of America's Foremost Heavy-Duty Trucks

WHY GASO PUMPS ARE FIRST IN THE FAVOR OF PIPELINE MEN

Series 2600—largest in the Gaso line. Designed to pump oil or water through long lines at pressures ranging from 475 to 1500 pounds per square inch. Rated capacity, 275 to 1000 barrels per hour.

Less Cost Per Barrel...

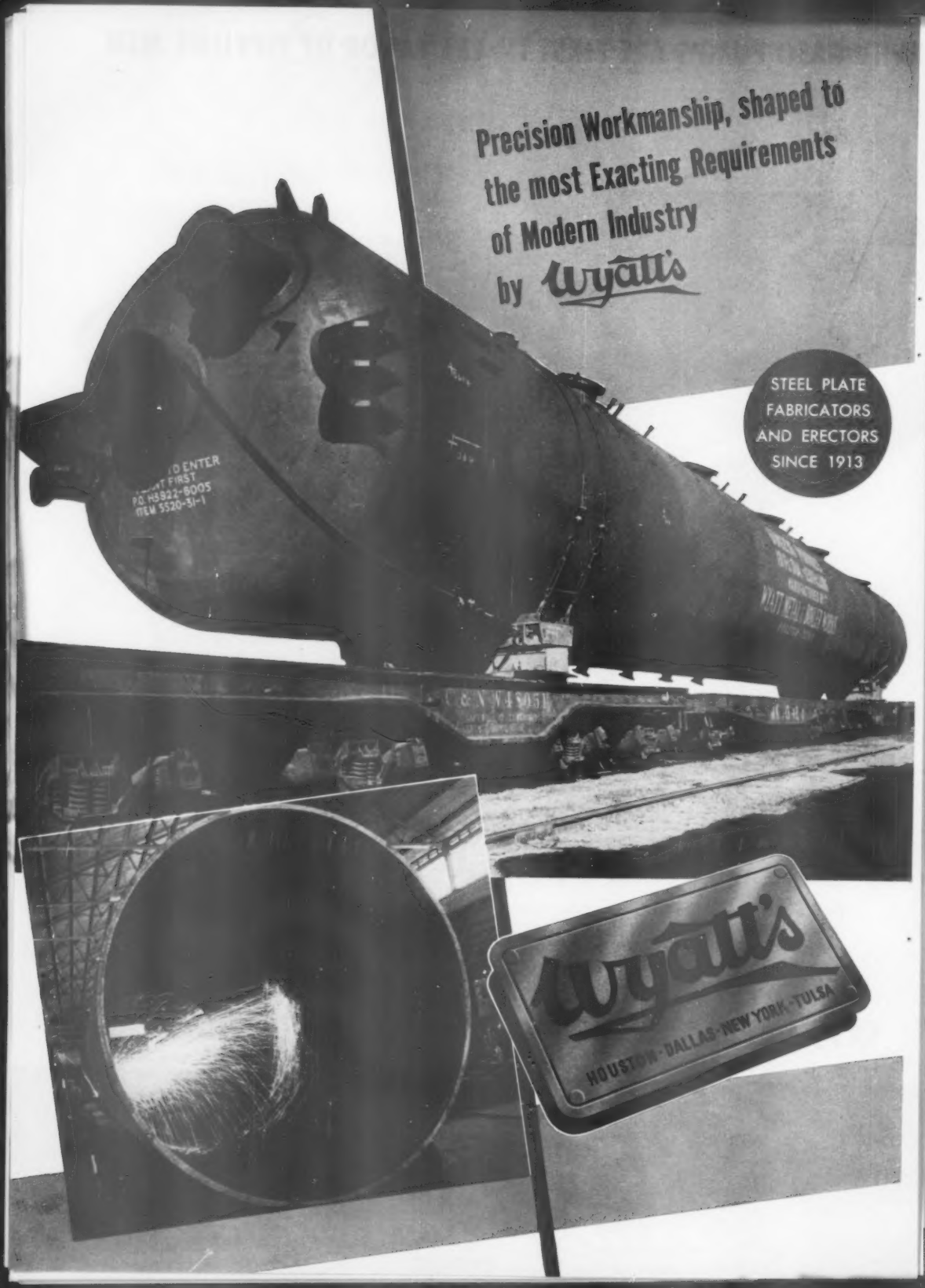
That's what counts in choosing pumps—the net cost per barrel of fluid pumped. The life of the pump, its operating cost and maintenance expense must all be considered in arriving at this figure. Take it from any veteran pipeline man—no pump in any field has a better record of economical performance than Gaso Pumps. We have made them that way for over 37 years. May we send you a copy of our latest catalog?

GASO PUMP & BURNER MFG. CO. 902 EAST FIRST ST., TULSA, OKLA.
EXPORT OFFICE: 149 BROADWAY, NEW YORK

Shreveport: W. L. SOMNER CO., 419 Lake Street • Los Angeles: 2529 Chambers St., Vernon • Western Canada: Lufkin Machine Co., Ltd., Edmonton, Alberta

GASO PUMPS

for every oil industry need


Precision Workmanship, shaped to
the most Exacting Requirements
of Modern Industry
by Wyatt's
STEEL PLATE
FABRICATORS
AND ERECTORS
SINCE 1913
Wyatt's
HOUSTON-DALLAS-NEW YORK-TULSA

Leading a Double Life

—yet it never shows the strain

The Amerada Type RPG-3 Gauge is actually a two-purpose instrument.

Use it to get a record of bottom-hole pressure. Then change just one part, and you have a temperature gauge.

The Amerada RPG-3 measures *only an inch and a quarter* in diameter. Yet slimness has not been obtained by sacrificing accuracy. On the contrary, the gauge is considered accurate to within 10 pounds of pressure or 1° of temperature!

How will the gauge stand up in service? And how will it do in a particularly corrosive well? Don't worry on either score. That long, slender tube is tough and strong — and has the necessary resistance to attack by sour crude, brine and acids! *It's made of Monel®.* And so are other parts inside.

The use of Monel, of course, is a design feature that needs no interpretation to oil field men. For Monel is the name you immediately associate with lots of important advantages . . .

You know, for example, that Monel combines strength and toughness with an exceptional degree of resistance to corrosion, abrasion and wear. It not only withstands shock, stress and high temperature, but resists the cutting action of pressurized gas and the heavy attack of entrained solids.

Monel, in short, is one metal that always gives a good account of itself. *And that's true anywhere—even in sour crude areas.*

For long-term service under difficult conditions, count on Monel. Your distributor of Inco Nickel Alloys can give you the latest information on its availability. And remember, when you order equipment made of Monel, that it's a good idea to anticipate your requirements somewhat in advance.

For help with problems involving metals for any oil field use, write to Inco's Technical Service. Their advice and suggestions won't cost you a cent, and may save you a pretty penny. THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York 5.

Measures Pressure or Temperature

Lowered into your well by wire line, the Amerada Type RPG-3 Gauge measures and records bottom-hole pressure or temperature on a metal chart.

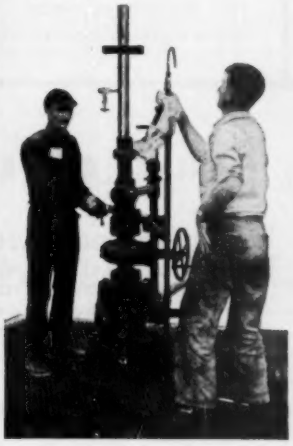
The entire outer housing is Monel. Use of this high-strength, corrosion-resisting nickel alloy makes the manufacture of a slender, thin-walled instrument entirely practical. As indicated here, many of the inside parts are also Monel.

When used as a pressure gauge, the instrument contains a helical Bourdon tube, secured at one end. Rotation of the free end is transmitted directly to a stylus, which makes a permanent record on a clock-driven metal chart.

The simple operation of replacing the pressure element with a thermometer element, changes the RPG-3 into a recording thermometer. Further details concerning the instrument may be obtained directly from the manufacturer, Geophysical Research Corp., Tulsa, Okla., through whose courtesy the illustrations and technical material on this page were supplied.

All these parts made of Nickel Alloys

1. **OUTER HOUSING** — Monel
2. **GAUGE**
   Push rod — Monel
   Stylus — partly Monel
   Chart holder — Inconel®
   Inner housing — Monel
   Inner housing cover — Monel
3. **PRESSURE ELEMENT**
   Housing — Monel



Inco Nickel Alloys

Monel . . . YOUR PARTNER IN PROGRESS

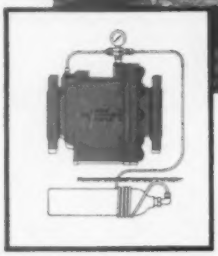
CONTROL

GROVE REGULATORS AND VALVES provide accurate, dependable pressure and flow control for air, gas, oil, water and other fluids. The proved principles embodied in Grove products are the results of years of intensive research and extensive field experience. Today these products are widely used in every branch of industry. Let Grove help with your control problems. Technical information gladly supplied.

Grove Flexflo Regulators for Back Pressure Service

The Flexflo is basically a diaphragm-operated valve, with the only moving part a flexible yet tough expansible tube which serves as both diaphragm and valve. No metallic moving parts to corrode, stick or wedge. No stuffing boxes to leak or freeze. Flexflos cannot fail to close perfectly with bubble-tight shut-off despite foreign particles or minor wear. Instantly responsive to the slightest pressure variations. Action is smooth and quiet, with no damaging slam or chatter. Sizes 1" to 12" for working pressures up to 1500 psi. and temperatures to 150° F.

All these important features add up to reliability. Maintenance-free performance you can count on day in, day out. Longer life under the most punishing field conditions. See how Flexflo's simple operating principle can increase your regulator efficiency. Contact your nearest Grove representative for details.



A Model 888 Grove Flexflo on Separator Gas Line. Pressure loaded operating cylinder is ground insulated against ambient temperature changes.

26102

VALVES AND REGULATORS

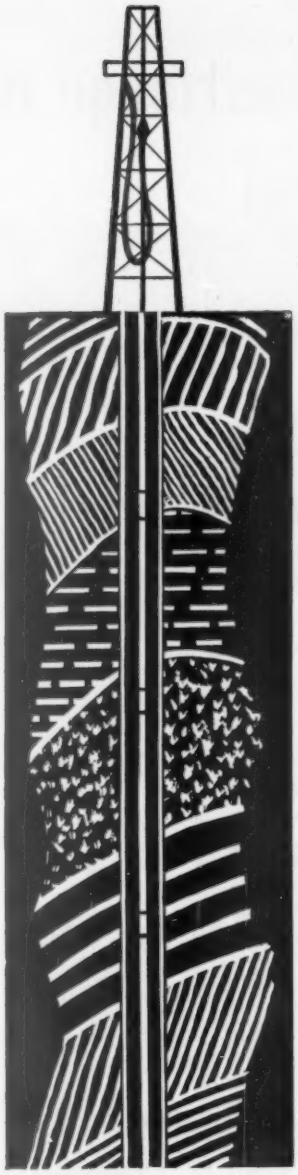
GROVE REGULATOR COMPANY

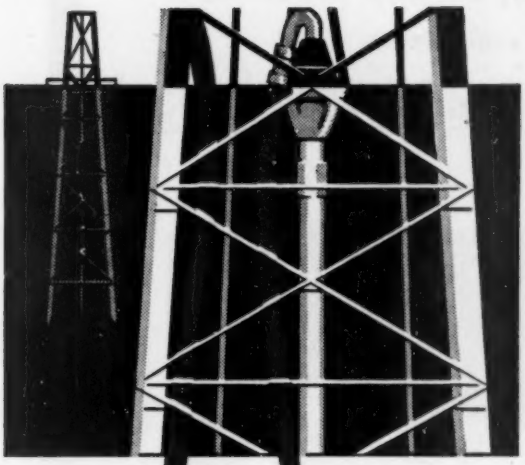
65th and HOLLIS STS., EMERYVILLE, CALIFORNIA
649 SOUTH OLIVE ST., LOS ANGELES 14, CALIFORNIA
1901 CALUMET, HOUSTON 4, TEXAS
415 LEXINGTON AVE., NEW YORK 17, N. Y.

DISTRICT OFFICES: Dallas, Corpus Christi, Odessa, Texas
Lafayette, Louisiana • Tulsa, Oklahoma

GROVE

GROVE
SIMPLICITY
ACCURACY
SAFETY





RAY-MAN ROTARY HOSE

MORE FOOTAGE DRILLED PER DOLLAR INVESTED

Ray-Man Rotary Hose stays with the rig. Features which lengthen the life of Ray-Man Hose add more miles of drilling for every dollar you invest. Oil-proof, gas-proof, and abrasive resistant, the exclusive Flexlastic tube can be used for all methods of drilling. Engineered flexibility in the hose reduces danger of damage and contributes to longer life • The built-in Type "E" Coupling with "Lip-Lok" Pressure Sealing Flange is another R/M feature which adds miles of drilling life to your rotary hose. This coupling has been field tested in every major oil field in the United States . . . and proved SAFE! • Details of Ray-Man Rotary Hose construction may be obtained by writing for Bulletin 6898.

DISTRIBUTED BY NATIONAL SUPPLY COMPANY IN ALL PRINCIPAL OIL FIELDS

RM

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Flat Belts

V-Belts

Conveyor Belts

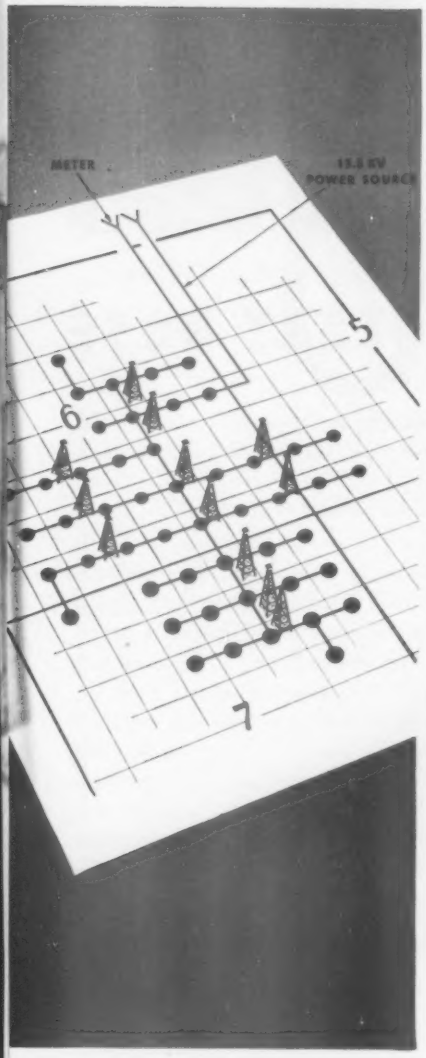
Air, Water, Steam Hose

Oil, Suction Hose

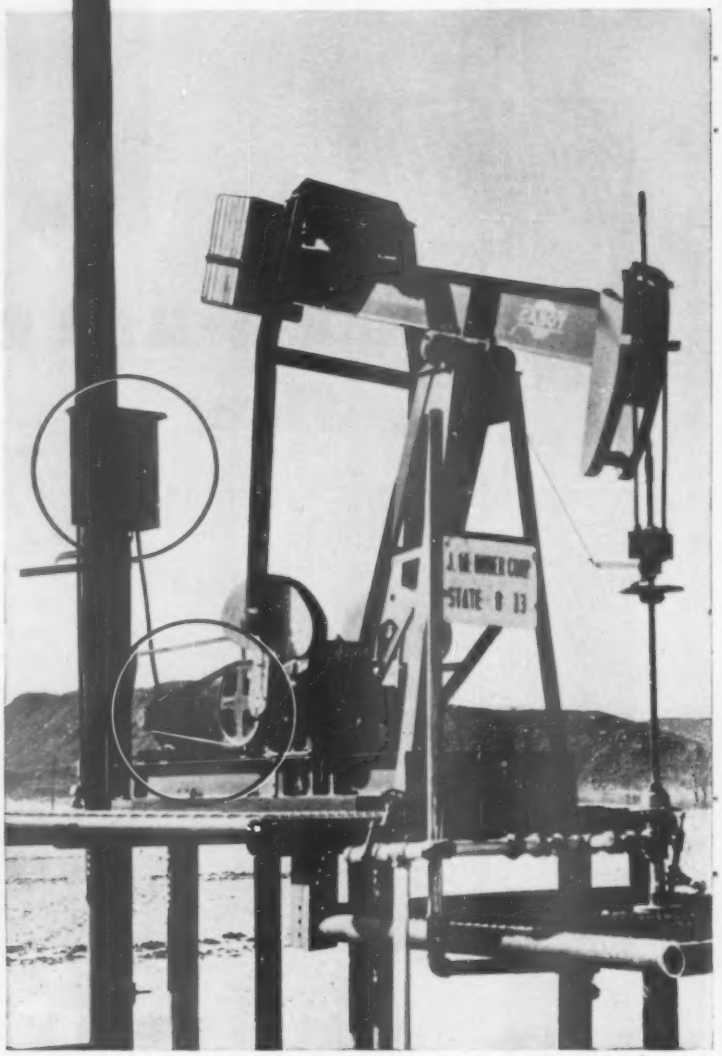
Industrial Fire Hose

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

They did what you can do to reduce costs



Cost of the complete power line for these 49 Oklahoma wells was only $378 per well. Pumping cost is only 4.1c per bbl.



This Westinghouse-equipped pumping rig operates in *blowing sand* in a dry river bed. However, it has given 100% performance!

An opportunity for major cost savings in petroleum production

Have you really studied the dollar and cents advantages of electrified pumping? Look at these two examples from the Westinghouse files.

Operates under severe conditions

The photo at left shows a rig mounted on stilts in a dry river bed in Texas. The service conditions are terrible—sand blows constantly except during the rainy season when the river bed floods. Yet the Westinghouse motor and automatic time control have given 100% performance since they were installed two years ago. They haven't even required contact replacement. The automatic control cuts the motor in and out as desired, with just a rare check by the pumper.

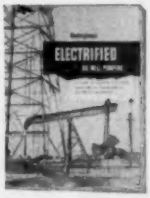
Pumps 49 wells for only 4.1c per bbl

But you don't have to have unusually severe conditions to make electrified pumping pay. A study of 49 wells in the Healdton field in Oklahoma, shows pumping costs of *only 4.1c per bbl.* Westinghouse automatic time control staggers the pumping load so that power load is just 47% of total connected load. The whole 49 wells are handled by one combination pumper-electrician. And the installed cost of the power line was only $378 per well, including transformers.

Call Westinghouse for planning help

Determining the best pumping method over the long run requires a careful economic analysis. It's a costly mistake to select equipment simply on the basis of what is easiest or cheapest to set up initially. Westinghouse would like to help you make the type of study that will show whether *you* can make major cost savings in your petroleum production. Call us in.

DO YOU HAVE YOUR COPY of this valuable guide on oil well pumping? Write for B-4039, "Electrified Oil Well Pumping," Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.
J-94908



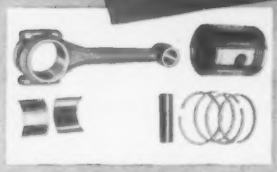
Westinghouse

WESTINGHOUSE

EQUIPMENT FOR THE PETROLEUM INDUSTRY

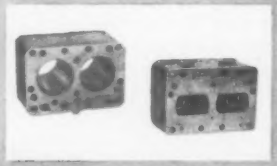
MM POWER UNITS

MINNEAPOLIS MOLINE
OILFIELD POWER

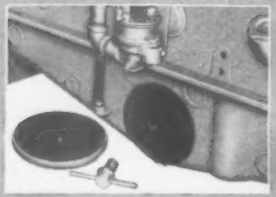


Connecting rods are drilled and have precision shell bearing inserts. Pistons are assembled in matched sets

Crankshafts and camshafts are of heavy section design, extra-large bearing area



Removable cylinder blocks and heads are cast in pairs separate from crankcase



Water jacketed base pan with built-in oil filter means longer service

* **10 YEARS OF CONTINUOUS OPERATION, 86,359 HOURS UNDER LOAD WITHOUT REPAIRS!** That's the record of an MM Power Unit for its California owner (name on request). More important are these facts which were attested to when the unit was dismantled and moved to another location: Crankshaft journals were smooth and showed a maximum wear of .0008; connecting rod journals showed maximum wear of .0005; main bearing shells had worn .001 or less and cylinders miked within .0028 *thru entire bore!*

There's a proud record and here's the reason: Standardized parts on MM Power Units make possible the very finest machine tooling, consequent closer tolerances and greater precision in production. That's your assurance that *MM means more for your money . . . better parts for lower cost at those infrequent times when even an MM needs servicing!*

Standardize on MM for lower-cost interchangeability that requires smaller spare part stocks.

DISTRIBUTED BY—

SHRIMPTON
MANUFACTURING & SUPPLY CO.

LOS ANGELES • OKLAHOMA CITY • KILGORE
Tel: Angelus 1-5132 Tel: 33254 Tel: 1241
ODESSA, TEXAS

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

Canadian distributor: Disher-Winslow (Alberta) Ltd., Edmonton, Alberta

STOP every type of collar leak!

SKINNER-SEAL collar leak clamp with sealed gasket

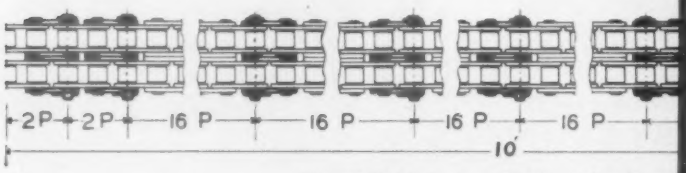
SKINNER-SEAL Collar Leak Clamps are standard equipment with most companies, for permanent repairs on oil and gas lines. Gasket is sealed by gasket container rings — pressure is sealed in . . . air, moisture and gasket-destroying soil conditions are sealed out. The pipe, not the collar, guides the packing into the leak. Rugged pressure rings, large diameter, high tensile steel, electroplated bolts and rigid container rings make the Collar Leak Clamp *effective under any pressure*. Handy wrench enclosed in each carton of 3 clamps. Sizes 2" — 12" incl. in stock at supply stores! M. B. Skinner Co., Est. 1898, South Bend, Ind.

SKINNER-SEAL COLLAR LEAK CLAMP

Now it's Even Easier!

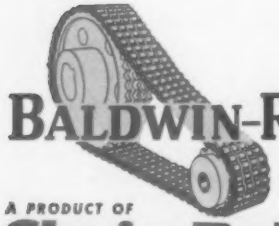
TO MAKE UP THE EXACT LENGTH OF CHAIN YOU NEED WITH IMPROVED BALDWIN ASSEMBLY RIVETED ROLLER CHAIN

The original Baldwin Assembly ("BA") Riveted Roller Chain completely eliminated old-fashioned, time-consuming, temper-trying, expensive chain cutting, while giving the user all the longer lived advantages of riveted chain. Now, with *Improved* Baldwin Assembly, chain coupling, uncoupling and repairs are faster, easier, less expensive than ever before.



No. 100 Baldwin Assembly Riveted Roller Ch

You buy Baldwin Assembly in a packaged unit—a 10-foot strand in every box. Each strand contains a number of conveniently located coupler links at which points the chain can be quickly and easily taken apart. (The location of the coupler links varies slightly for each chain size.) By combining two or more of the sections in the basic 10-foot length, any length of chain required can be made up in the shortest possible time. What's more, there's no danger of damaging chain parts while doing it. If more than 10 feet of chain is needed, just buy an extra box.

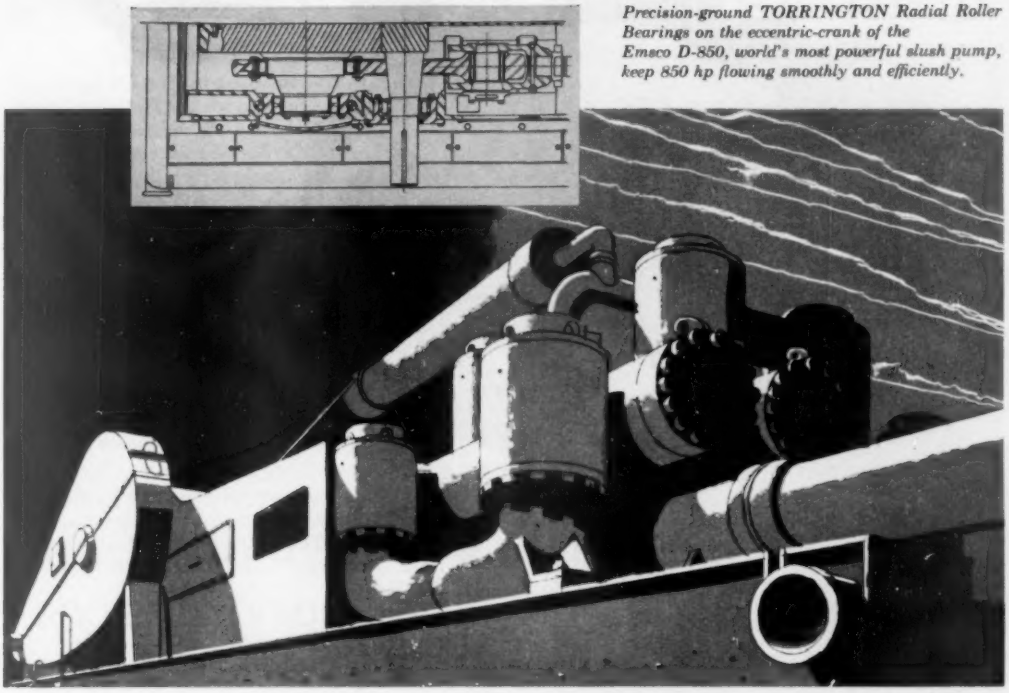


BALDWIN-REX®
ROLLER CHAINS

A PRODUCT OF
Chain Belt COMPANY
OF MILWAUKEE

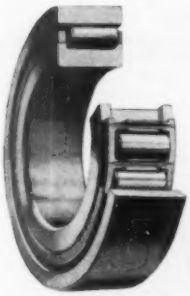
Baldwin-Rex Oil Field Sales Offices:
New York • Tulsa • Dallas • Houston • Midland • Los Angeles

Get all the facts on why the Improved Baldwin Assembly is better than ever. See your local supply store or write for Bulletin 52-3. Chain Belt Company, 4619 W. Greenfield Ave., Milwaukee 1, Wis.



Precision-ground TORRINGTON Radial Roller Bearings on the eccentric-crank of the Emsco D-850, world's most powerful slush pump, keep 850 hp flowing smoothly and efficiently.

Specified for the world's most powerful slush pump!



Bearings for the eccentric-crank of the world's most powerful slush pump—the 850 hp Emsco D-850—must be built to take a beating.

That's why Emsco specified TORRINGTON Radial Roller Bearings.

TORRINGTON Radial Roller Bearings are specially designed to cut friction under high radial loads. Their cast-bronze cages are *land-riding*. Their contact surfaces are *precision-ground*.

Results: free flowing power, longer bearing life.

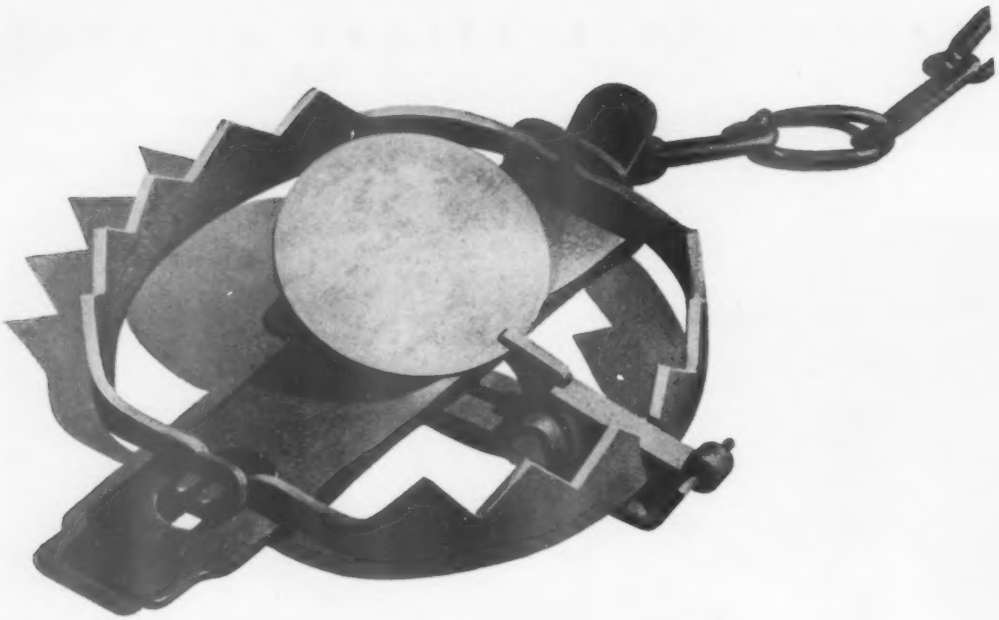
Also specified were self-aligning TORRINGTON Spherical Roller Bearings for the main shaft and rugged, compact NCS Needle Bearings for the crosshead. Thus maximum operating efficiency and minimum operating costs were doubly assured.

Specify TORRINGTON Bearings for your own pumps—and for all your other oil-field equipment. There's a precision-ground TORRINGTON Bearing for every application.

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.

TORRINGTON RADIAL ROLLER **BEARINGS**

Spherical Roller • Needle • Tapered Roller • Straight Roller • Ball • Needle Rollers



All over your building,
fire sets its traps. In pumping stations,
transformer vaults, oil storage rooms.
In fact, wherever it can
stop your business in its tracks.
Make sure you don't fall victim.
Post a KIDDE Portable Extinguisher
next to every fire hazard.

Kidde

Walter Kidde & Company, Inc.,

254 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

Want the one tube steel for your job that gives the best life/cost ratio? *Ask the experts!*

IT'S very likely that several of the high temperature steels listed below are adaptable to your particular conditions of heat, pressure, oxidation and corrosion. But one and only one will give you the best life to cost ratio.

To find that one steel, *ask the experts!* Ask the metallurgists of The Timken Roller Bearing Company. They're recognized authorities on high temperature steels. They're backed by 20 years' experience and research in the high temperature steel field. They'll help you choose the one best steel for your application from one of the 23 different analyses at their disposal. And you'll be assured of uniform quality in every tube because the Timken Company rigidly controls the quality of the steel from melt shop through final inspection.

The Timken Company's RSQ—Research, Supply, Quality—can solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

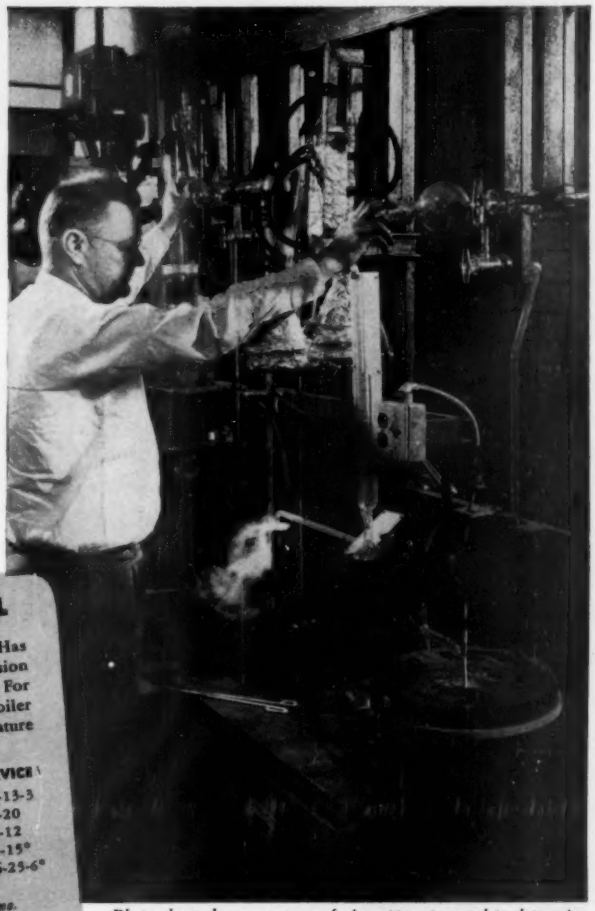


Photo above shows a vacuum fusion apparatus used to determine gases in steel. It's just one of the many phases of research on high temperature steel carried on by the Timken Company.

This month the Timken Company reports on:

DM-2 STEEL

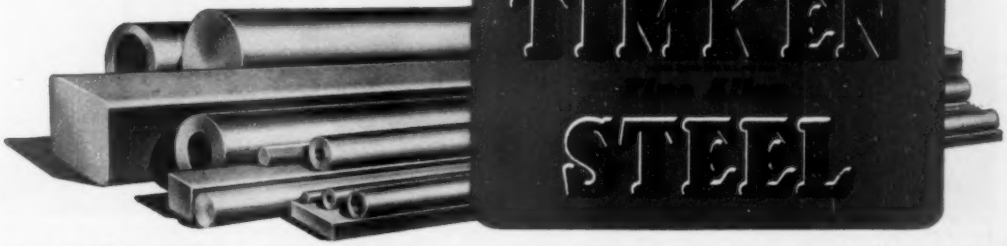
Suggested as a substitute for 0.50% Mo. steel. Has greater creep strength and somewhat better corrosion and oxidation resistance than 0.50% Mo. steel. For use in cracking furnace tubes, high pressure boiler tubing, superheater tubing and high temperature steam piping.

23 TIMKEN® STEELS FOR HIGH TEMPERATURE SERVICE

Carbon	Sicromo 2	Sicromo 5S	16-13-3
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	25-20
DM-2	2¼% Cr.-1% Mo.	Sicromo 7	25-12
Silmo	Sicromo 5	Sicromo 9M	35-15*
DM	4-6% Cr.-Mo.	18-8 Stainless	16-25-6*
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	

*Not available as seamless tubing at the present time.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

Launching Site. R. H. Crowe, Chief Engineer of Transcontinental Gas Pipe Line Corp., receives word that the big pipeline has reached Brooklyn shore.

In Position. Pipeline section is lowered onto launching cradle. Radio coordinated all work crew activity.

HOW G-E 2-WAY RADIO SPEEDED

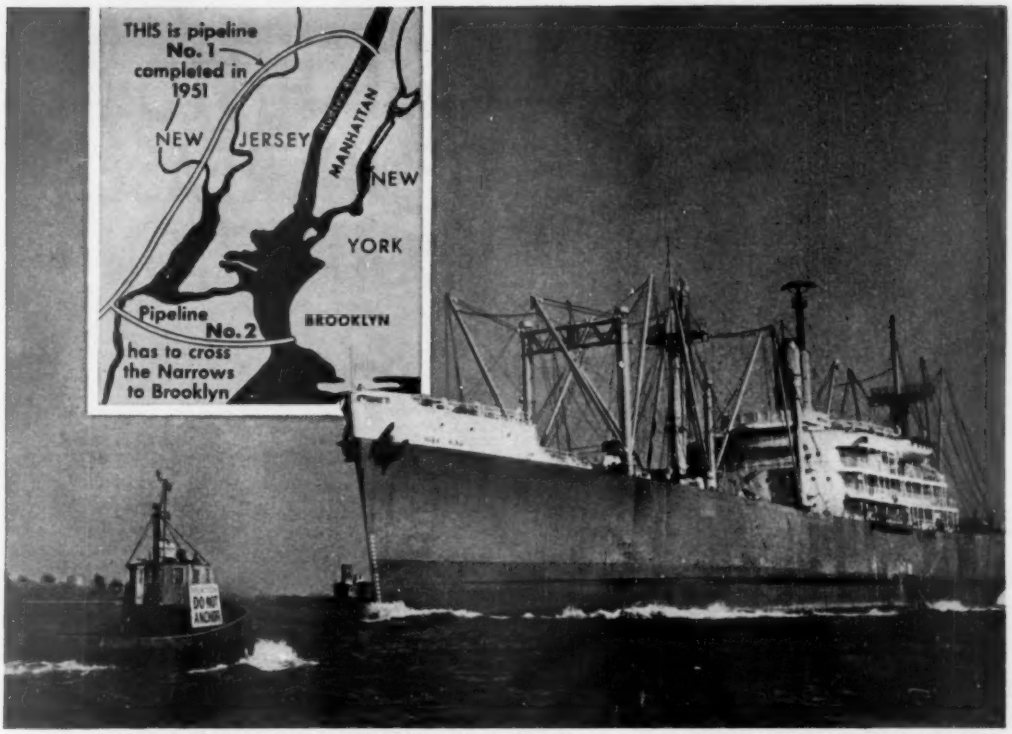
Transcontinental Gas Pipe Corporation

INSTALLATION OF LONGEST PERMANENT

River Patrol. G-E radio keeps headquarters in range for Bobby Gates, Gates Bros. Marine Service, on patrol near pipeline launching area.

Pipeline Assembly. Sammy Collins, Collins Construction Co., calls for additional work crews at the pipe section assembly site.

Launching Control. Billy Glascock supervises winching a pipe section into position. Lengths were welded into eight sections of 800' to 900'.



Heavy Harbor Traffic. Pipeline work in the middle of the world's busiest harbor called for dependable tug-to-shore radio communication.

UNDERWATER CROSSING

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

Pipeline Bridges 6,600-Foot Gap from Staten Island to Brooklyn, N. Y.

DETAILED planning to coordinate work crews and equipment activity was a must before Collins Construction Co. of Houston, Texas, tackled the Narrows operation for Transcontinental. Collins is widely respected both for the engineering "know-how" they bring to a job and keen anticipation of all emergencies. On the Transcontinental assignment they rigged a special launching device, a controlled buoyancy pontoon hookup plus an ingenious hauling winch. When the hauling cable broke on the last section, *instant contact* via G-E 2-way radio with divers and key supervisory personnel helped retrieve the auxiliary cable quickly.

Good communications equipment plays an increasingly important role in every job . . . big or small. You can depend on G-E units as the Collins Co. does to get instructions to work crews fast, order supplies in a second, co-ordinate equipment and the overall job activity.

The CAS* man in your local G-E office has complete information on the latest communications equipment to solve your problem. Call him now or write: *General Electric Company, Section 823-23, Electronics Park, Syracuse, New York.*

**Communications Advisory Service*

You can put your confidence in—

GENERAL ELECTRIC

An independent in South Texas replaced conventional mechananical equipment with the Carter Unit. This was a depletion-type reservoir, making very little water, so that the conventional equipment could not be slowed down enough to keep from overpumping the well. The slow-motion VARIABLE-CYCLE operation of the CARTER Unit was the answer.

Major Oil Company in West Texas replaced old central-power equipment with the CARTER Unit. Well was extremely gassy. The slow-motion, VARIABLE-CYCLE effect was able to control this condition and improve production.

This astonishing increase was obtained by a major company in North Texas when they replaced conventional equipment with the CARTER Unit. Well made a large amount of gas. This was controlled by use of the slow-motion, VARIABLE-CYCLE operation obtainable only with the CARTER Unit.

CASE HISTORIES OF INCREASED PRODUCTION with

Carter

long-stroke Hydraulic Pumping Units

featuring — **the amazing Variable-cycle Principle**

Designed • Built • Priced for Stripper wells

In a surprising number of instances, replacement of conventional equipment with the CARTER Long Stroke Hydraulic Pumping Units has resulted in substantial production increases.

Why?

There are two principal reasons: accurate control of the pumping rate; and the VARIABLE-CYCLE Principle.

This means that any stripper well, regardless of how low its production rate, can be pumped continuously, on a 24-hour basis without pumping off or pounding fluid in a manner which very nearly approaches constant flow!

In addition to these features, CARTER Units are designed specifically for stripper wells, which means that the initial investment is low — in fact, on some installations savings up to 50% have been reported as against conventional equipment!

Write for Bulletin PR-253

S. C. CARTER COMPANY, inc.

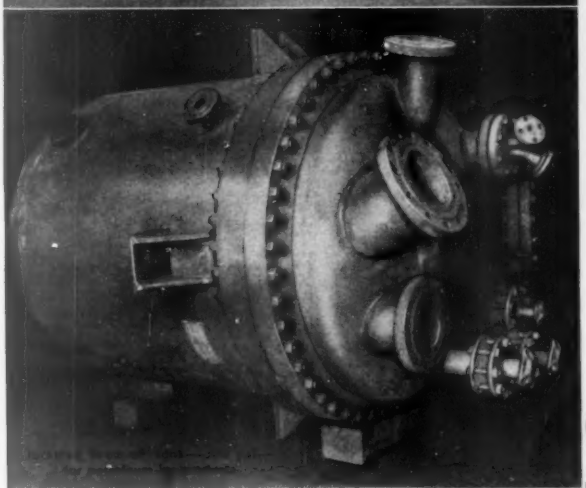
1900 Santa Fe Avenue • Los Angeles, California

Sales and Service Representatives in —

Artesia — Borger — Bossier City — Casper — Dallas Great Bend — Healdton — Irvine — Los Angeles — Odessa Oil Springs — Owensboro — Pampa — Princeton — Salem Robinson — Tulsa — Wichita Falls — Winfield

Export: Calgary — Edmonton — Caracas — Maracaibo Puerto La Cruz — Port of Spain

Two Quench Pots 8' x 21' 6" —35 psi—
for petrochemicals

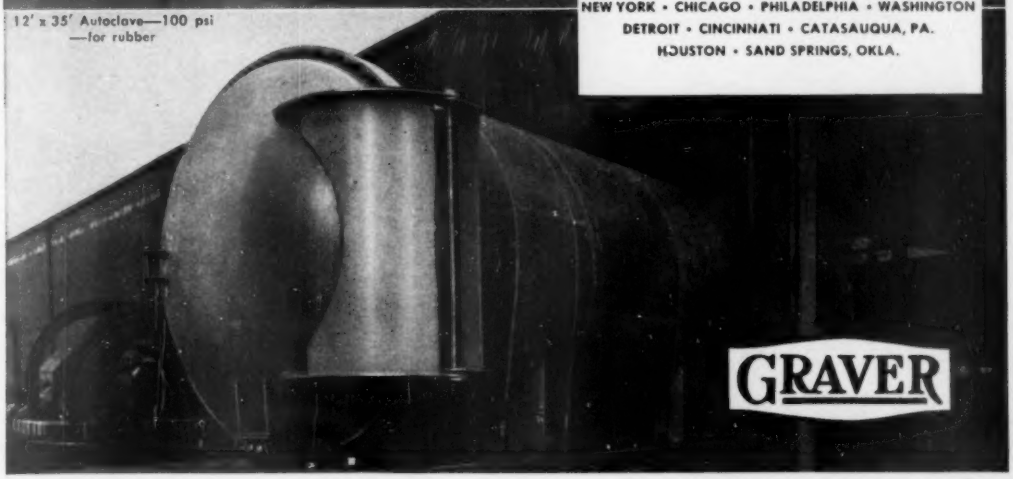


Processing plants today increasingly require specially designed pressure vessels. Graver has long been expert in the fabrication of code vessels, whether API-ASME, ASME or even more stringent specifications set by customers. Graver-built pressure equipment assures long life and safe, dependable service.

The steady flow of steel, clad and alloy pressure vessels through Graver's plants is suggested by these shop views. They indicate the many skills and services obtainable through Graver's high standards of welding craftsmanship.

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA
NEW YORK • CHICAGO • PHILADELPHIA • WASHINGTON
DETROIT • CINCINNATI • CATASAUQUA, PA.
HOUSTON • SAND SPRINGS, OKLA.

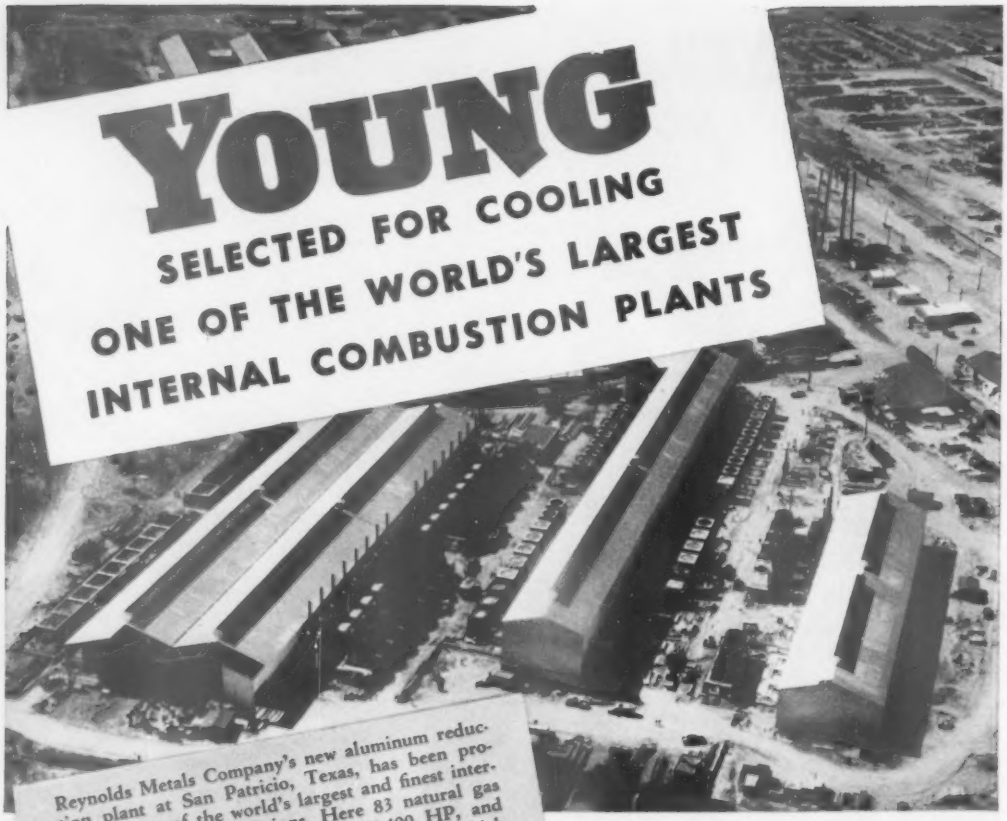
12' x 35' Autoclave—100 psi
—for rubber



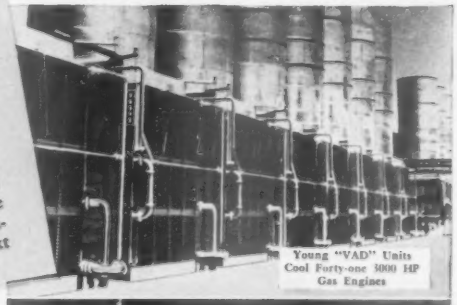
GRAVER

YOUNG

SELECTED FOR COOLING ONE OF THE WORLD'S LARGEST INTERNAL COMBUSTION PLANTS



Reynolds Metals Company's new aluminum reduction plant at San Patricio, Texas, has been proclaimed one of the world's largest and finest internal combustion installations. Here 83 natural gas driven Diesel engines generate 278,400 HP, and develop a total of 543,000,000 BTU per hr., which must be dissipated. Young's heat transfer organization . . . with completely integrated facilities for the design, development, manufacture, testing, rating, and installation servicing of specialized heat transfer equipment was commissioned to handle the cooling job. 83 rugged, compact, thermostatically controlled units, for cooling the Engine Jacket Water and Lube Oil, plus 84 Supercharger Air Intercoolers for increasing both horsepower and efficiency of engines, were delivered by Young. Certified Ratings and more than a quarter century of proved performance in the field assure complete satisfaction. Take advantage of this experience . . . specify that your next job is Young-engineered.



Young "VAD" Units
Cool Forty-one 3000 HP
Gas Engines

Young "HC" Units
Cool 42 Cooper-Bessemer
3700 HP Gas Engines

YOUNG

HEAT TRANSFER PRODUCTS FOR AUTOMOTIVE AND INDUSTRIAL APPLICATIONS.

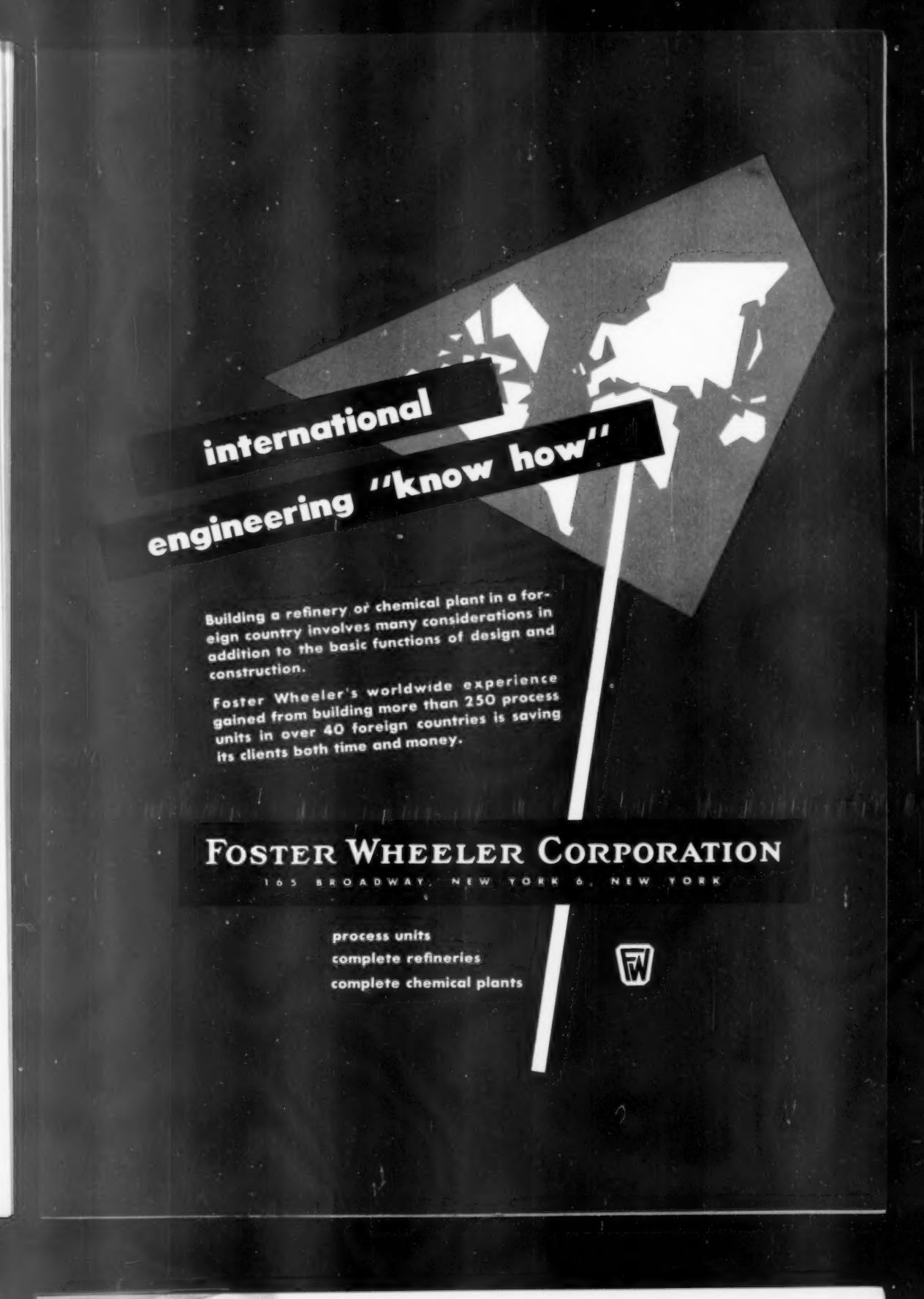
HEATING, COOLING, AND AIR CONDITIONING PRODUCTS FOR HOME AND INDUSTRY.

T. M. REG. U. S. PAT. OFF.

YOUNG RADIATOR COMPANY

Dept. 203-B • RACINE, WISCONSIN

Factories at Racine, Wisconsin, and Mattoon, Illinois


international
engineering "know how"
Building a refinery or chemical plant in a foreign country involves many considerations in addition to the basic functions of design and construction.
Foster Wheeler's worldwide experience gained from building more than 250 process units in over 40 foreign countries is saving its clients both time and money.
FOSTER WHEELER CORPORATION
165 BROADWAY, NEW YORK 6, NEW YORK
process units
complete refineries
complete chemical plants
FW

England

Construction continues at England's largest refinery.

Canada

A recent completion at Edmonton.

at work around the world

Trinidad
Scandinavia
Italy
Argentina
South Africa
Colombia
Brazil
Holland
Philippine Islands
Australia
Venezuela
Belgium
and in the USA

France

Catalytic cracking and other units under construction in France.

FOSTER WHEELER

Complete engineering facilities at New York, Paris, London, St. Catharines, Ontario and Houston, Tex.

Keep Heat Transfer Surfaces CLEAN...

SPECIFY

Vogt

SCRAPED SURFACE *Exchangers*

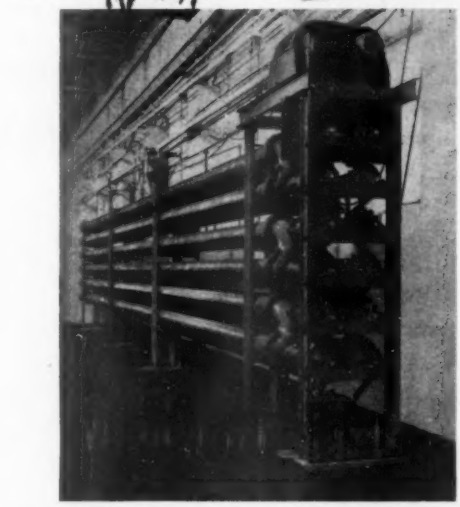
IF you are all "gummed up" with a tough heat transfer problem, Vogt Scraped Surface Exchangers will provide the answer. They have patented scraper elements which prevent fouling of the heat transfer surfaces and insure the highest rate of heat exchange between the product and the cooling or heating medium. The scrapers also continuously agitate the fluid and assist removal of solids from the unit.

DOUBLE PIPE EQUIPMENT is available in two types; EXCHANGERS, for cooling with water, brine, and cold filtrate, and for heating with steam or hot liquids; and CHILLERS, for use with volatile refrigerants such as ammonia, propane, and Freon. Both types have 8" jacket pipes and 6" inner pipes with scrapers.

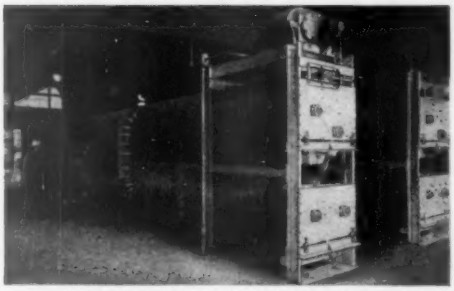
SHELL AND PIPE TYPE UNITS are designed for use with volatile refrigerants and for heating fluids with steam or similar heating mediums. They consist of large welded shells each containing seven 6" scraped pipe sections.

Vogt Scraped Surface Exchangers serve profitably as oil chillers, crystallizers, and heaters in many processes in the petroleum and chemical industries. Their application to your heat transfer problems will receive the prompt attention of our Engineering staff.

Write for Bulletin PE-1



*DOUBLE PIPE UNIT. Drive end close-up of 12 section unit under test in our shop.



*SHELL and PIPE UNITS. Two of five units installed in a leading petroleum refinery.

*Patented

HENRY VOGT MACHINE CO.

LOUISVILLE 10, KENTUCKY

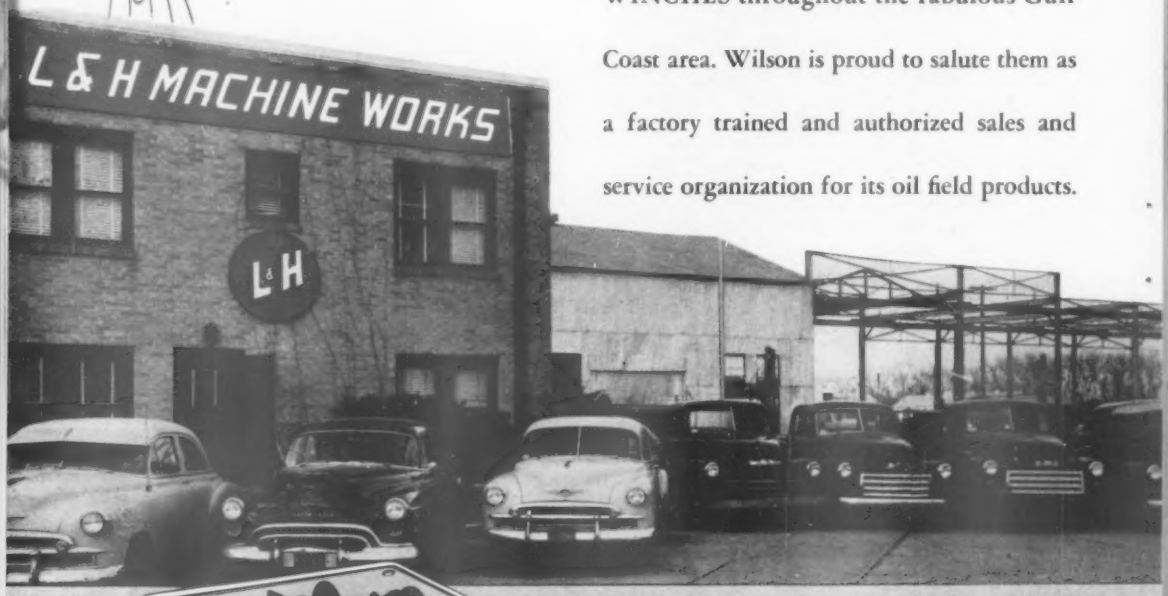
Branch Offices:

NEW YORK • PHILADELPHIA • CLEVELAND • CHICAGO

ST. LOUIS • DALLAS • CHARLESTON, W. VA.

Tune Your Rig with

Personalities such as Jim Tune, the "Shrimp and Fish Chef Supreme" and V. B. Likins, identify L & H Machine Works more quickly than anything else. These men, they modestly tell you, are "Front Men" of a skilled staffed and completely equipped shop which can handle any repair or service job required for WILSON RIGS and WINCHES. "We've been in the oil field equipment sales, service and repair business for over thirty years," says Tune, "and we know how to keep drilling and service equipment in top running order." Yes, L & H is a valuable accompaniment to the famous line of WILSON RIGS and WINCHES throughout the fabulous Gulf Coast area. Wilson is proud to salute them as a factory trained and authorized sales and service organization for its oil field products.



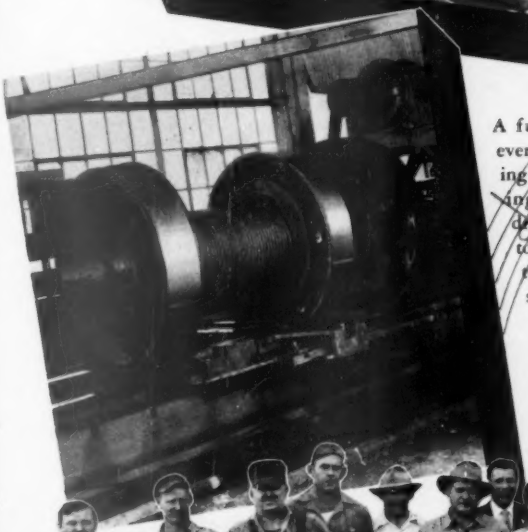
WITH Wilson YOU'RE FAR AHEAD of the FIELD

COMPARE FEATURES...QUALITY...PRICES

Tune at L & H

L & H MACHINE WORKS

2205 QUITMAN • HOUSTON TEXAS



A fully equipped shop for everything from steam cleaning rigs to precision machining and heat-treating of drum flanges, plus a factory trained service crew to handle any repair or service job needed on WILSON RIGS and WINCHES, adds to the efficiency of

Wilson

MANUFACTURING CO., Inc.

WICHITA FALLS, TEXAS

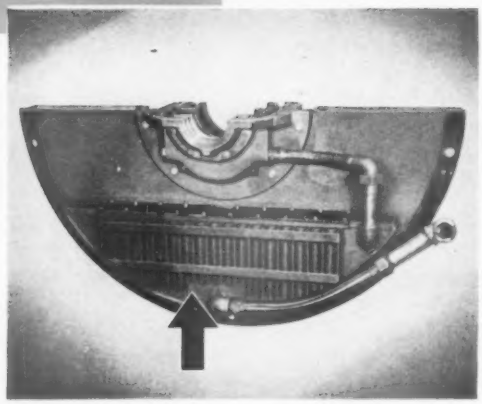
3 like this for TEXAS EASTERN

ELLIOTT

squirrel-cage induction motor designed especially for pipe line service

Above is shown one of the three Elliott 2500 hp 2-pole motors now serving Texas Eastern Transmission Corporation, driving compressors on the pipe line. Special waterless oil-cooling feature is described at the right. These big motors are built of fabricated steel, engineered for extreme rigidity, ease of access and maintenance, and may be supplied in any type of enclosure, standard or special.

Write for the Induction Motor Bulletin.



THE AIR-COOLED OIL RESERVOIR

is shown in this inside view of a bearing bracket. Note the heat-radiating fins which lie right in the path of incoming ventilating air. This feature not only eliminates the complexities of water circulation apparatus, but better still, makes water unnecessary — a vital factor where water is at a premium.

ELLIOTT Company

Ridgway Division
RIDGWAY, PA.

FOR MOTORS 1—200 HP:
CROCKER-WHEELER DIV., AMPERE, N. J.
Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

R 2-22

RIGHT AT THE BEGINNING—

Plan on using Bitumastic® Enamel to protect your pipe line against corrosion

ANY pipe line, whether large or small, is an important investment — an investment that should be properly protected.

That's why it's wise, when planning a new pipe line, to include Bitumastic Enamel in your designs, plans and specifications. Bitumastic Enamels, manufactured from selected coal-tars, have proved they can prevent corrosion. Many oil and gas pipe lines that were coated with Bitumastic Enamel and laid 20 and 30 years ago are still in good service today.

Why not let your Koppers representative work with you from right at the beginning through final operations? He will be glad to assist you in getting the most out of your protection dollar.

KOPPERS BITUMASTIC ENAMELS

REG. U.S. PAT. OFF.

KOPPERS COMPANY, INC., Tar Products Division, Dept. 203-T, Pittsburgh 19, Pa.

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

"Can you furnish an efficient heat exchanger for 2 fluids of different transfer rates?"

"I need a stock design of heat exchanger for quick shipment."

"Do you have a standardized heat exchanger that can be used for a variety of services?"

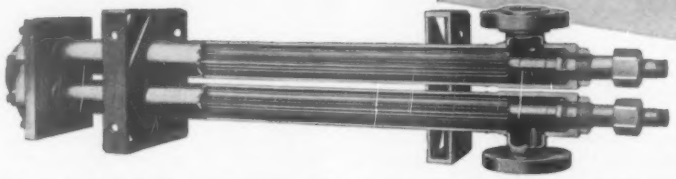
"Is it possible to get a heat exchanger with fins and tubes of different materials?"

"I want a heater system that will require least spare units."

FIVE QUESTIONS

One Answer...

THE G-R TWIN G-FIN SECTION



Yes, this "Universal Heat Exchanger" meets all these needs . . . and many more. It actually has the widest range of heating, cooling, condensing and heat exchange applications of any heat transfer apparatus on the market. • The G-R Twin G-Fin Section has proved its effective design and durable construction through 20 years of service. • This unit is the simplest type of heat exchanger, easy to install, economical to maintain, and with high salvage value because of its standardized design. Write for bulletin describing the many Twin G-Fin Section advantages in detail.

THE GRISCOM-RUSSELL CO., MASSILLON, OHIO

GR-266

GRISCOM-RUSSELL

PIONEERS IN HEAT TRANSFER APPARATUS

IF IT'S POWER YOU WANT.... Specify

the WILSON-SNYDER
NO. 220-P SLUSH PUMP

Here is a Power Slush Pump built for the heavy duty work that present drilling demands. It has greater capacity and greater horsepower.

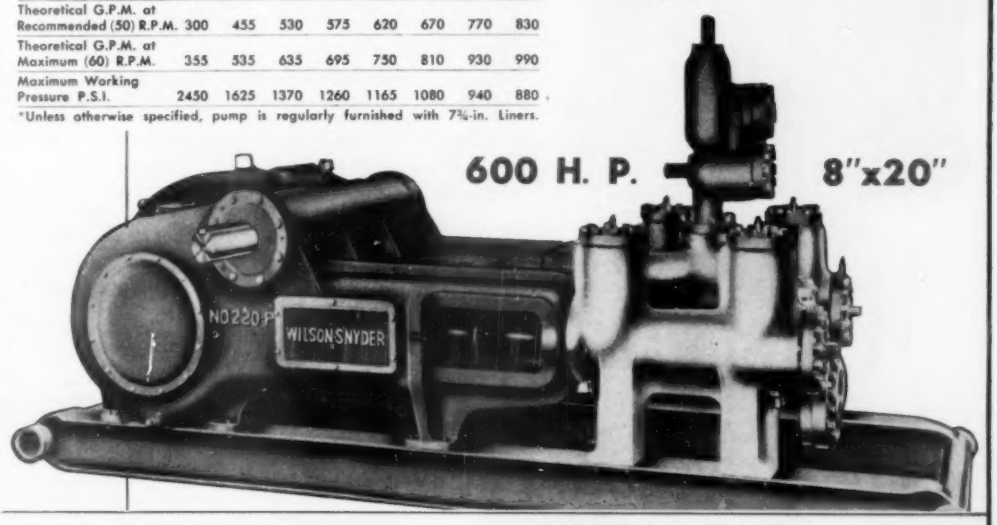
Naturally it is larger and more powerful.

Some of the many Wilson-Snyder features found in the No. 220-P are: (1) single helical gears with shafts set in adjustable tapered roller bearings, (2) oil bath lubrication, (3) grease lubricated crosshead pin bearings, permitting lubrication without shutting down, (4) special arrangements of the diaphragm packing and the mud baffle, (5) deep stuffing boxes, designed for rod lubrication, (6) Di-Hard Liners with Tell-Tale Liner Packing and Heavy Duty Liner Spacers with outside adjustment, (7) Heavy Duty Fluid Valves.

Displacement (Rod Deducted) and Pressure Range

Available Liner Sizes	5-in	6-in	6½-in	6¾-in	7-in	7¼-in	7¾-in	*8-in
Theoretical G.P.M. at Recommended (50) R.P.M.	300	455	530	575	620	670	770	830
Theoretical G.P.M. at Maximum (60) R.P.M.	355	535	635	695	750	810	930	990
Maximum Working Pressure P.S.I.	2450	1625	1370	1260	1165	1080	940	880

*Unless otherwise specified, pump is regularly furnished with 7¾-in. Liners.



Call or Write Houston Headquarters or your nearest Wilson Store for additional information

Exclusive Distributors—Louisiana and Texas Gulf Coast

WILSON SUPPLY COMPANY

BRANCH STORES

TEXAS—Alice, Corpus Christi, Victoria, Bay City, Columbus, Barbers Hill, Liberty, Beaumont, Kilgore, Monahans. LOUISIANA—Lake Charles, New Iberia, Houma, Harvey, Shreveport.

1301 Conti St. (Cor. of Walnut)
HOUSTON, TEXAS

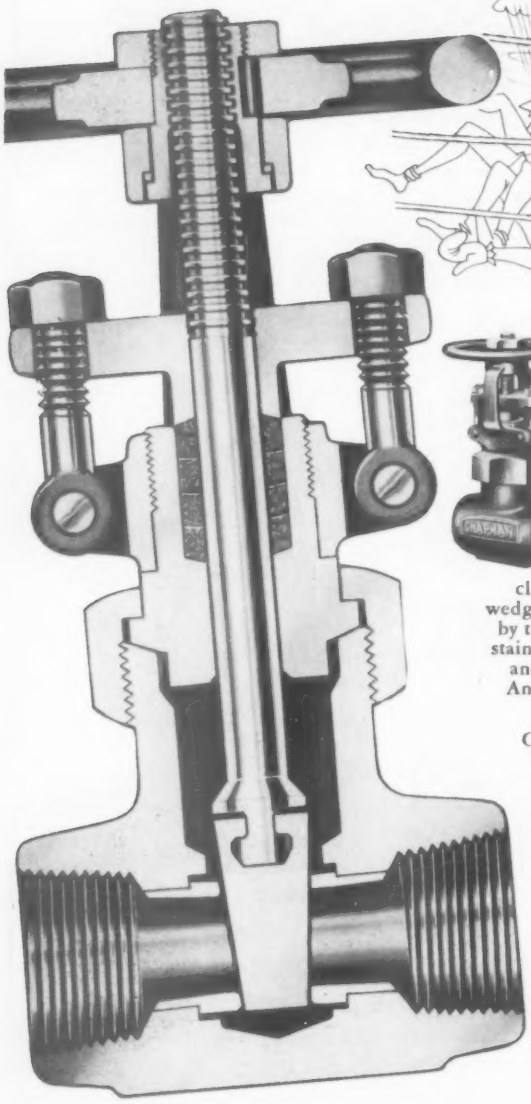
SALES OFFICES

Tulsa
Dallas
Shreveport
New Orleans

CHAPMAN LIST 960

Holds More Titles...

than any valve of its kind



Yes, here's the champ of all small forged steel gate valves! It has licked more different jobs than you can shake a stick at . . . and stays in there fighting with all the *extra stamina* you get in *every* Chapman Valve.

Here are the reasons why: Extra protection against even unusual stress when opening and closing the valve is provided by extra-strong stem-and-wedge-gate connection. Repairs and replacements are cut by the use of super-hardened seat rings and gate faces of stainless steel. Forged body and yoke are longer-lived . . . and bolted follower has no threads on yoke to corrode. And lastly, gate faces won't seize or gall because they're *Malcomized* (Chapman patent) to 800 Brinell.

Chapman List 960 Forged Steel Gate Valves are made in sizes from ½″ to 2″ inclusive . . . with rising stem with yoke (shown) or with rising stem with inside screw. Bonnet joints are either gasketed or metal to metal. Pressure range: 2,000 lb. at 100° F. — 380 lb. at 1,000° F. For higher pressures, specify List 990. And for full details on List 960, send today for your copy of Catalog 10.

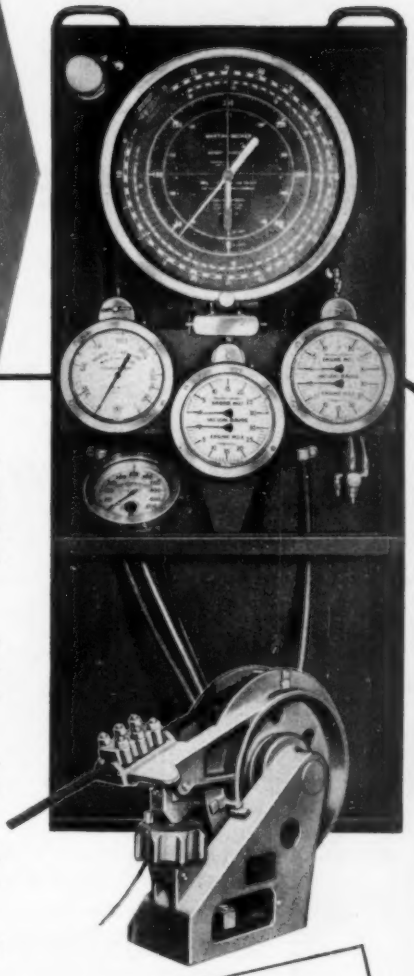
THE CHAPMAN VALVE MFG. CO.

INDIAN ORCHARD, MASS.

Accurate

under all conditions

HYDRAULICALLY OPERATED



THE MARTIN DECKER TYPE "D" WEIGHT INDICATOR AND IDEAL TYPE "D" WIRE LINE ANCHOR COMBINATION is positively unaffected by temperature changes, leaks, or variations in fluid volume.

More Sensitive—More Convenient

A CONVENIENT WEIGHT INDICATOR which shows accurately the weight of the drill string directly in thousands of pounds—the pull on stuck pipe—shows tight hole when making trips and the total load on the derrick.

A BIT WEIGHT INDICATOR shows the driller directly and accurately in thousands of pounds on a 4 to 1 magnified scale the Net Weight on the bit.

A VERNIER WEIGHT INDICATOR graduated in 1000-lb. increments is extremely sensitive for fishing, milling, cutting, etc.—showing variations of as little as 25 lbs. in 50,000.

A SIMPLE RECORDER gives the engineer a permanent record of each 24 hours operation.

AN ADAPTABLE WEIGHT INDICATOR which can be mounted at the driller's position or at the most convenient location where the slightest change in hook load can be interpreted.

Write for Descriptive Literature!

"D", "E" and "F" Combinations

are in use all over the world.

There are three combinations:
THE TYPE "D"—
For a dead line load of 60,000 lbs.
THE TYPE "E"—
For a dead line load of 90,000 lbs.
THE TYPE "F"—
For a dead line load of 40,000 lbs.

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY: T. C. CULLEN, BAKERSFIELD, CALIFORNIA
MID CONTINENT DISTRIBUTOR: REED ROLLER BIT COMPANY, HOUSTON, TEXAS
CANADIAN DISTRIBUTOR: REED ROLLER BIT COMPANY OF CANADA, LTD., CALGARY & EDMONTON, ALBERTA

MARTIN-DECKER WEIGHT INDICATORS AND IDEAL WIRE LINE ANCHORS ARE ALSO SOLD THROUGH THE NATIONAL SUPPLY EXPORT CORP., THE NATIONAL SUPPLY CO. AND OTHER RECOGNIZED SUPPLY HOUSES

C-O-TWO

TRADE MARK

REG. U.S. PAT. OFF.

FIRE EXTINGUISHERS

give fast, positive fire protection

● Top quality backed by experienced engineering results in operating superiority at all times with the world famous C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguishers as well as the newer C-O-TWO Dry Chemical Type Fire Extinguishers. Furthermore, modern manufacturing facilities and extensive field testing, together with approvals such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratories and Government Bureaus assure you of fast, positive action the instant fire strikes.

CARBON DIOXIDE TYPE

With C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguishers the penetrating carbon dioxide is a clean, dry, non-damaging, non-conducting inert gas . . . smothers fire in seconds, leaves no after fire mess . . . highly effective on flammable liquid and electrical fires, as well as some surface fires involving ordinary combustible materials. The C-O-TWO Squeez-Grip Valve is the greatest single contribution to the releasing of carbon dioxide for first aid fire fighting . . . just squeeze lever to open . . . release to close.

Convenient 2½, 5, 10, 15 and 20 pound hand sizes . . . discharge horn non-conducting, shatterproof construction. Also, convenient 50, 75 and 100 pound wheeled sizes . . . available with sturdy, wide-faced wheels either with or without rubber tires, as well as available with or without discharge hose and horn protection cover.

DRY CHEMICAL TYPE

With C-O-TWO Dry Chemical Type Fire Extinguishers the heat-shielding dry chemical is a non-conducting, non-abrasive, non-toxic, finely pulverized powder compound . . . blankets fire instantly . . . exceedingly effective on flammable liquid, gas and electrical fires, as well as surface fires involving ordinary combustible materials. The exclusive inverting design renders constant free flowing dry chemical, assuring faster, more effective and complete discharge.

Convenient 4, 20 and 30 pound hand sizes . . . no syphon tubes or valves within the cylinder to become clogged or inoperative . . . discharge hose and squeeze type discharge nozzle remain empty until actuation takes place . . . one piece removable top assembly. Also, convenient 150 pound wheeled size . . . sturdy, wide-faced wheels . . . discharge hose and two position discharge nozzle having soft or solid stream fully enclosed in protection casing . . . footrail and dual bar handle provide easy inverting.

Act now for complete free information on these fast, positive fire extinguishers. Remember fire doesn't wait . . . get the facts today!

C-O-TWO

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

C-O-TWO FIRE EQUIPMENT COMPANY

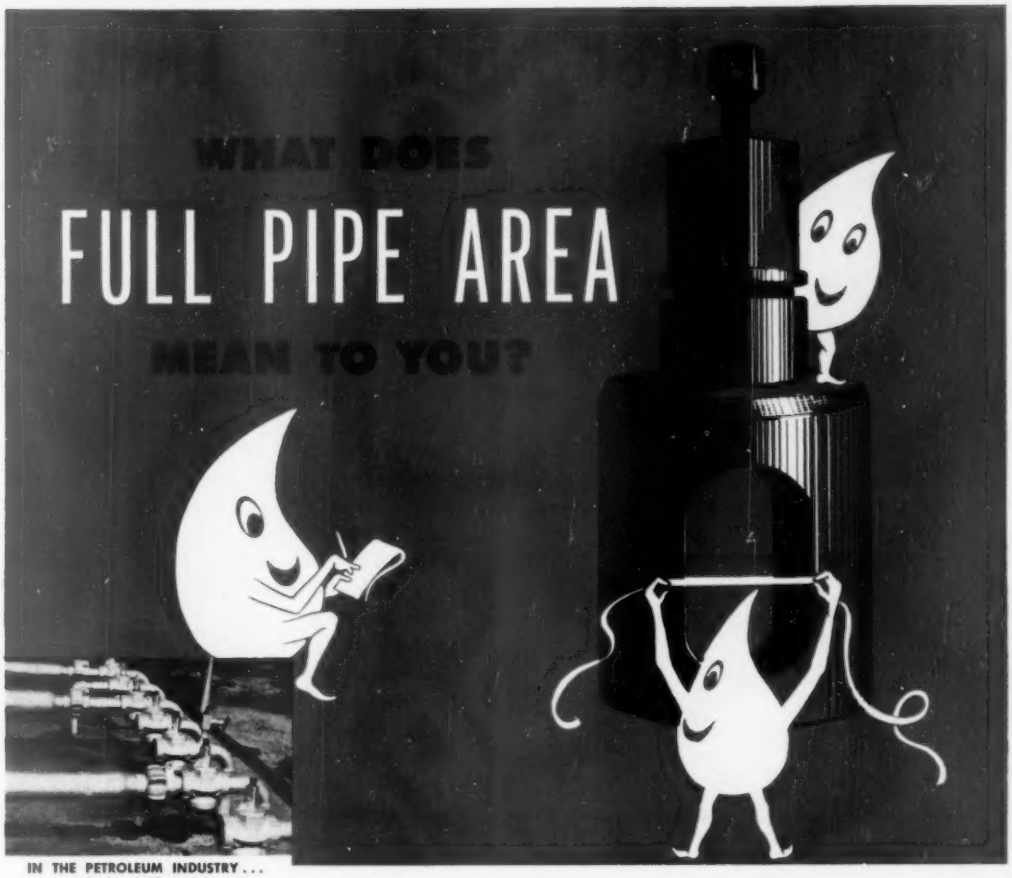
NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

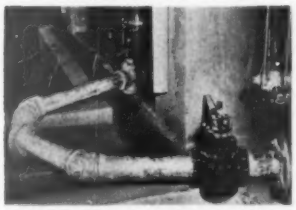
Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

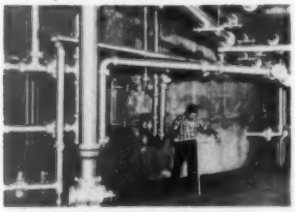
WHAT DOES FULL PIPE AREA MEAN TO YOU?



IN THE PETROLEUM INDUSTRY . . . a.c.f. Cylindrical Plug Valves give full flow, quick quarter-turn shut-off.



ON CHEMICALS viscous heavy ladings or materials in suspension flow freely without turbulence.



IN SEWAGE PLANTS a.c.f. Cylindrical Plug Valves handle raw sewage with ease—plug shears obstructions.

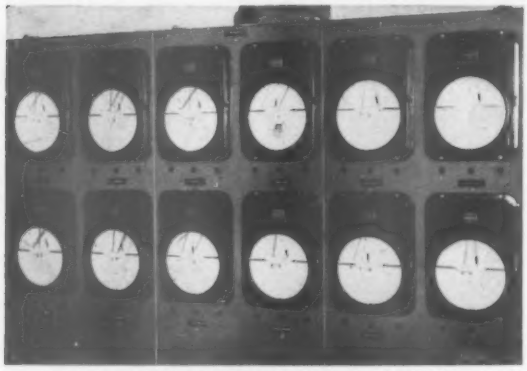
It means, primarily, a smooth, straight-through flow. Look through an a.c.f. CYLINDRICAL Plug Valve, and you'll see why solids in suspension and heavy, viscous ladings pass so easily. There are no restrictions to retard flow! The valve port has an area at least as large as the pipe itself. For the lowest head loss of *any* plug valve in the world, specify a.c.f. CYLINDRICAL, Lubricated Plug Valves. You'll save time and pumping cost!

a.c.f. CYLINDRICAL FULL PIPE AREA PLUG VALVES

Write for Catalogue 4-OG, American Car and Foundry Co., Valve Division, 1501 E. Ferry Ave., Detroit 11, Mich.

Representatives in 50 Principal Cities

GAS DISPATCHING MADE EASIER



THESE BRISTOL METAMETER RECEIVERS are in the dispatcher's office of Colorado Interstate Gas Company.

AREA COVERED BY BRISTOL METAMETER TELEMETERS. This installation has been in operation for four years.

by Bristol Metameter* telemeters and remote control

No matter how far-flung and complex a pipe line system may be, critical pressures and flows all along the line can be observed and controlled from a central point by Bristol Metameters.

The use of Metameters by the Colorado Interstate Gas Company is typical. Bristol Metameter receivers in its Colorado Springs dispatching office record suction and discharge pressures at nine of the compressor stations along its 555 mile gas pipe line and the flow and static pressure at five of its metering stations.

These Metameter telemeters give the dispatcher a clear picture of pressure and flow conditions along the entire pipe line.

Many other pipe line and gas companies from coast to coast use Bristol Metameter to obtain up-to-the-minute knowledge of what is going on throughout their systems and maintain finger-tip control over any combination of conditions that may arise. Several installations have been in operation over 15 years.

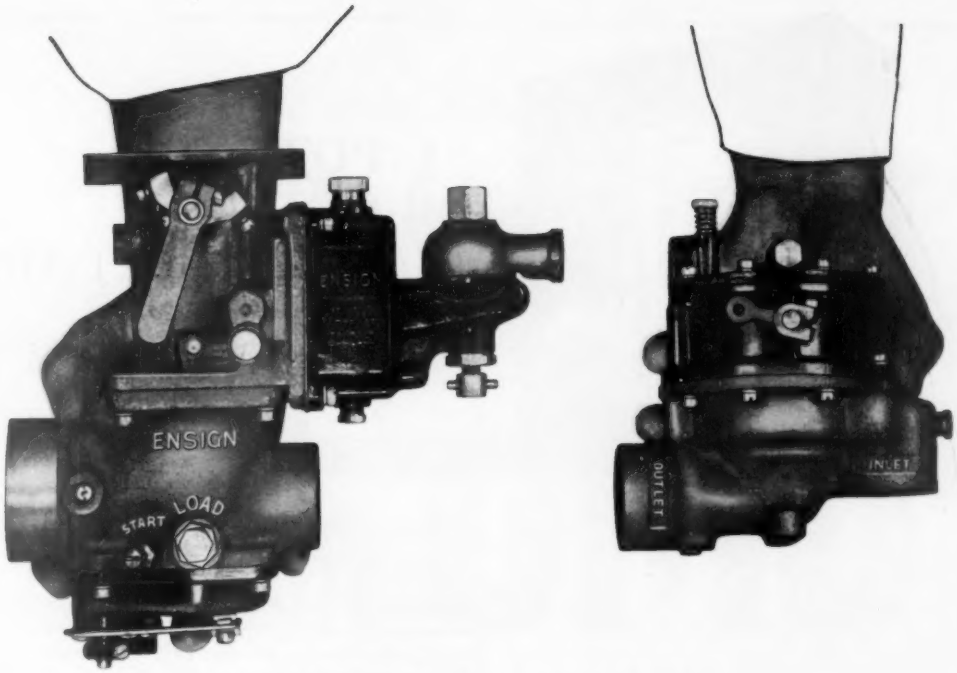
Use by pipe line companies includes (in addition to those mentioned above) remote setting of regulators and flow controllers; remote readings of pressure at transfer point and flow of gas into distribution system; sounding alarms when low and high limits of pressure and flow are exceeded; totalizing flow through several lines. Readings are transmitted over any two-wire circuit or its equivalent (private wires, telephone circuits, carrier channels and radio, including microwave). Receivers may be recording (narrow or wide strip or round chart) or indicating.

For further information on the use of Metameters by pipe line and gas companies, from coast to coast, request Bulletin M1700, THE BRISTOL COMPANY, 120 Bristol Road, Waterbury 20, Conn. *Reg. U. S. Pat. Off.

THE DEPENDABLE GUIDEPOST OF INDUSTRY

BRISTOL

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS



ENSIGN

Ensign is an old familiar name in the oil industry. For many years it has been a symbol of DEPENDABILITY. A gas engine powered drilling rig or pumping unit, when equipped with Ensign carburetion, is under all operating conditions most likely to give the best service. This is because of our unending search for improvements in the carburetor art plus the fact that all improvements are subjected to rigorous laboratory and field tests before they can carry the name ENSIGN.

The carburetor above, Model Kgnl, is a combination gasoline-natural gas and propane unit. The Model B fuel regulator is designed for natural gas or propane. When propane is used, the vaporizer shown below is also employed. Ensign catalogs completely describe the hook-up, which is fast and easy to make.

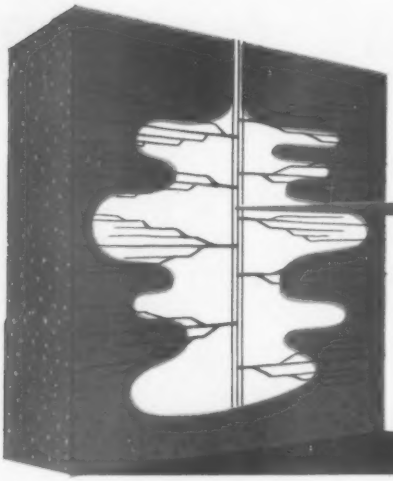
ENSIGN LP-GAS (Propane) VAPORIZER

Converts liquid fuel to dry gaseous vapor prior to entering the Model B fuel regulator and carburetor.

ENSIGN CARBURETOR COMPANY

7010 So. Alameda St. Huntington Park, Calif.

2330 West 58th St. Chicago 36, Ill.



POTENT PAY ZONE PENETRATION

HALLIBURTON'S MCA

Removes Flow Restrictions . . . Boosts Production!

Halliburton's revolutionary Mud Cleanout Agent is penetrating deep into plugged pay zones and dissolving channel restrictions to increase productive flow.

MCA, a precise combination of Halliburton's famed Morflo and hydrochloric acid, actually increases the effective production from formations containing appreciable amounts of bentonite.

This decisive double-action agent not only shrinks clay but causes particle dispersion. And filter cake, softened by MCA's Morflo content, can be washed away and flushed from the formation.

MCA's superiority in treating bentonitic sands insures that the bentonite will not rehydrate even though the treated formations become flooded with fresh water.

Usual job procedure requires only a small amount of MCA. About 500 gallons are used initially on most new wells, although a second or third treatment may be recommended in wells where the mud has penetrated formations to extreme depths.

Used prior to squeeze cement jobs or in solving remedial well problems, MCA is winning increased attention throughout the petroleum industry.

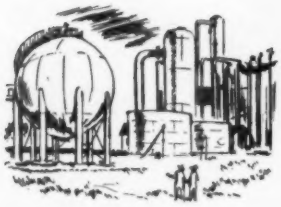
Make good use of this effective chemical agent. Your nearby Halliburton representative can explain its advantages in minutes. Or contact Halliburton Oil Well Cementing Company, Duncan, Oklahoma.

HALLIBURTON

YEARS AHEAD IN PRODUCTION IMPROVEMENT TECHNIQUES!

New Powerful Weed Killer Cuts Fire Hazards

for **OIL INDUSTRY**



Du Pont CMU

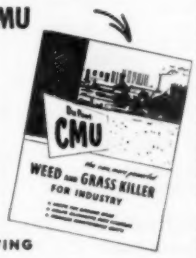
KEEPS GROUND BARE OF WEEDS AND GRASS

Small quantities of Du Pont CMU kill weeds and prevent regrowth. CMU controls most species that are a fire hazard around tank farms, oil and gas wells, refineries, pumping stations, above-ground pipelines and barrel yards.

- Economical, low application rates usually keep ground clear through an entire growing season or longer. As little as 40 lbs. per acre or 1 lb. per 1000 square feet often does the job.
- Kills most broad-leaved weeds and grass. Best results come with applications before weed growth starts.
- Eliminates fire hazards caused by unwanted vegetation.
- Saves labor, cuts maintenance costs. One easily applied spray takes the place of hand cutting, mowing and other methods of maintenance.
- Non-flammable, non-volatile, non-corrosive to equipment. Comes as wettable powder to mix with water.

Get This Full-Color, Illustrated Booklet Showing Results With CMU

Also tells how to use it. For your copy, use the coupon.



DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Dept., H-2 Wilmington, Del.

Please send me illustrated booklet and other information about CMU.

Name_____

Firm_____

Street_____

City_____ State_____

THE EASIEST WAY TO MAKE ENDS MEET

VICTAULIC FULL-FLOW TEES ELBOWS AND ALL TYPES OF FITTINGS ALL WIDELY ADAPTABLE AND EASY-TO-INSTALL ARE ONLY PART OF THE COMPLETE MODERN VICTAULIC 4-STAR METHOD OF PIPING. YOU ARE ASSURED FAST, STREAMLINED EFFICIENT CONSTRUCTION THAT SAVES $$$$ WITH VICTAULIC COUPLINGS FOR LOCK-TIGHT, LEAK-PROOF CONNECTIONS AT EVERY JOINT UNDER PRESSURE OR VACUUM; PLUS CONVENIENT PORTABLE VIC-GROOVER TOOLS FOR GROOVING STANDARD PIPE ENDS WITH SPEED AND EASE; AND QUICK, HANDY ROUST-A-BOUT COUPLINGS FOR PLAIN END PIPE AND ALL-'ROUND VERSATILITY. MAKE SURE YOUR NEXT JOB IS ALL VICTAULIC! PROMPT AVAILABILITY FROM LOCAL DISTRIBUTOR STOCKS COAST-TO-COAST.

Write today for Victaulic Catalogue-Manuals

VICTAULIC COMPANY OF AMERICA · P. O. Box 509 · ELIZABETH, N. J.

Office and Plant: 1100 Morris Ave., Union, N. J. · Telephone Elizabeth 4-2141

West Coast: Victaulic Inc., 2330 East 8th St., Los Angeles 21 · Canada: Victaulic Co. of Canada Ltd., 406 Hopewell Ave., Toronto 10 · Export: Pipe Couplings, Inc., 30 Rockefeller Plaza, N. Y. 20, N. Y.

COPYRIGHT 1953, BY VICTAULIC CO. OF AMERICA

They Say—

Comeuppance From Japan

Sir:

There seems to me an apparent misprint in "Table 1—Jet Fuel Specifications" appearing on page 96 of the October 6, 1952, Journal.

In the fourth column . . . under the item "Distillation, °F.," the 90 per cent minimum and maximum evaporation are both designated at 550° F. Might not this be a mistake?

F. Horie
Chief, Refining Department
Koa Oil Co., Ltd.
Tokyo.

Editor's note: Reader Horie is correct. The 550° F. distillate temperature is for the 90 per cent evaporated maximum only. The error was noted after publication and corrections were made in the January 5 issue (page 85) and the January 12 issue (page 119).

A Briton Takes Exception

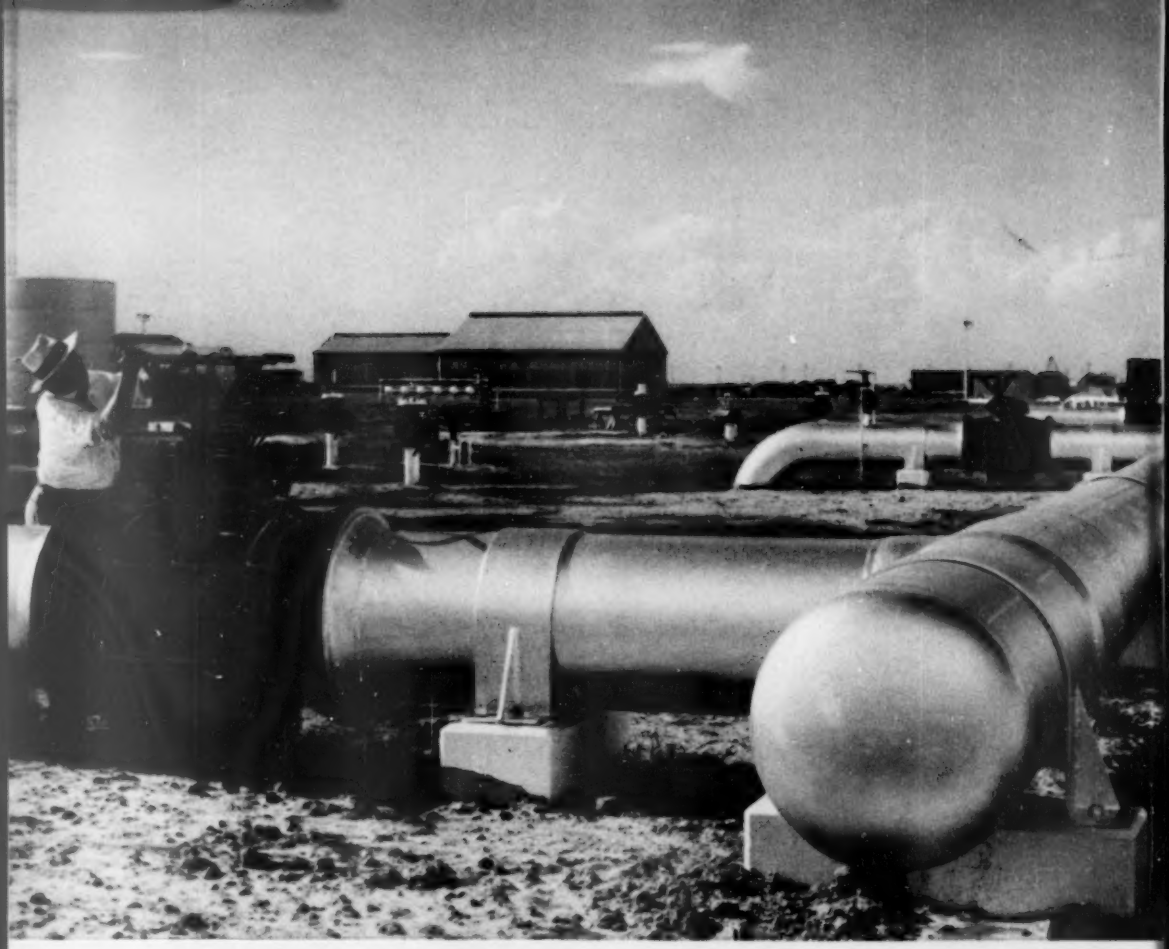
Sir:

The editorial on page 63 of your December 8 issue submits evidence of "foreign bungling" on the part of your government. As citizens of the United States you are entitled to criticize your administration.

On page 55 of the same issue under your regular feature "They Say" you reproduce extracts from an address reported to have been given by Max Ball to the Washington, D. C., chapter of A.I.M.E.

If your report is correct, Mr. Ball, in dealing with the situation arising from the expropriation of Anglo-Iranian's interests, suggested similar action might ensue "in any country that has not grown up enough to recognize the sanctity of its contracts, etc." And he then asks, according to your report, "What countries have reached political maturity?" He declares the list is short —"The United States, Canada, Israel, India, Pakistan, Afghanistan . . . "

No mention of Great Britain or of other parts of the British Commonwealth. I wonder why, especially when ours is so often referred to as the "Mother of Parliaments." Maybe, because we are so old we are in our second childhood and are thus deemed to be immature. Senile though we may be, I seem to remember reading that at one time even the great American continent of the United States shared our heritage, but this may be a delicate subject. I also read at school that a couple of centuries ago you indulged



WHEN YOU

Standardize on Nordstrom Valves You Standardize on Dependability

Whatever the service, whatever the size of the line, write Nordstrom valves into your standards. That way, you can make your first valve installation in any spot a permanent one.

Rockwell | **Built**
Another Rockwell Product | **Nordstrom Valves**

LUBRICANT SEALED TO KEEP UPKEEP DOWN

A $150 Valve with a $5,000,000 Job

Somewhere in almost every plant, somewhere in almost every line of flow, there is a key valve—a valve that *must* operate in an emergency.

Often one small valve that costs only a few dollars protects plant investment running into millions and human life beyond price.

Take the case of the valve shown here. This is the control valve which actuates the cylinder controlled Nordstrom valves in case of emergency, and divorces the compressor station from the main line. It closes the inlet and outlet of the station and opens the main line valve.

Most often a key valve like this will be a Nordstrom. Because Nordstroms perform so well in key spots . . . because any piping system is only as good as the valves that control it, naturally Nordstrom valves have been specified for thousands of petroleum, gas, chemical and general industrial services.

The Nordstrom record of dependability and low cost is the best recommendation you could ask. Rockwell Manufacturing Company, 400 N. Lexington Ave., Pittsburgh 8, Pa.

Rockwell | **Built**
Another Rockwell Product | **Nordstrom Valves**

LUBRICANT SEALED TO KEEP UPKEEP DOWN

in a War of Independence which you won, but sensibly retained our language (almost) and your parliamentary institution is not unlike ours, although much younger in the circumstances.

If I had any dollars at all I should be tempted (1) to bet that if Mr. Ball (good old English name) was guilty of this serious omission he will hasten to make amends, and also (2) to bet that this epistle of mine will not be printed in your otherwise admirable journal—or have I got you wrong?

W. J. Allen
CHEAM, Survey
England.

Mutual Responsibility Abroad

"We think a country is entitled to a fair share of the profits resulting from the company's operations; the employment and training of its nationals; the availability of petroleum products to meet local needs; and the observance of the customs of the land by the company and its employes.

"On the other hand, the company is entitled to security of title, management of its own affairs, and a reasonable profit."

T. L. Lenzen, vice president of Standard Oil Co. of California, addressing the Desk and Derrick Club of San Francisco.

Misrepresented Mountie

Sir:

Please refer to page 84 of your February 2 edition . . . The two men admiring the motor-driven toboggan are not both crew members of the Socony crew. The man on the left is a constable of the Royal Canadian Mounted Police. He is wearing a buffalo skin coat and the blue trousers and the gold stripe of our famous police force. No doubt it is his toboggan.

C. O. Hambie
Boyles Bros. Drilling (Eastern), Ltd.
Kirkland Lake,
Ontario.

CALENDAR OF EVENTS

FEB.

27 Natural Gasoline Association of America, regional meeting, Scharbauer Hotel, Midland, Tex.

MAR.

2- 6 American Society for Testing Materials, spring meeting, Statler Hotel, Detroit.

From Surabaya to Maracaibo...

More major oil fires have been put out with Pyrene Air Foam Equipment than with any other. Throughout the world—the Middle East, the Far East, Europe and South America—Pyrene* has long been *the* equipment for oil field and tank farm protection. Pyrene is available to you. Wherever *you* are—whatever *your* hazard—Pyrene is prepared to provide you with a built-in air foam system you can count on. For complete information, or the help of a Pyrene engineer, write us today.

*T.M. Reg. U.S. Pat. Off.

PYRENE MANUFACTURING COMPANY
579 Belmont Avenue, Newark 8, New Jersey
Affiliated with C-O-Two Fire Equipment Co.

Pyrene AIR FOAM

The Pyrene Company, Limited, England
Pyrene Manufacturing Co. of Canada, Limited

Engineering sales and service representatives: Stentz Equipment Co., P.O. Box 3367, Tulsa; also Dallas, Houston, Midland, Odessa • Horn Fire Equipment Co., 4917 Sheila, Los Angeles

BARCO SWING JOINTS

FOR LOADING AND UNLOADING LINES

HERE is Barco's new, attractively priced, all-steel ball bearing *Swing Joint* designed specifically for refinery *service* on loading or unloading lines handling gasoline, oil, lube oil, LP gas, petro-chemicals, and other fluids.

11 DIFFERENT STYLES—The Barco line is complete with single swing, double swing, and counter-balance styles to meet every need! Sizes 2", 2½", 3", 4".

SUPERIOR DESIGN—In Barco Swing Joints, *the ball bearings do not fall out when joints are taken apart!* Long bearing provides adequate pipe support. Special O-ring seal insures leakproof service over wide temperature range, −40° F. to +225° F.

EASY MAINTENANCE—Joints can be disassembled for inspection without disconnecting piping. O-rings are easily renewable in the field.

INFORMATION—Send for latest Catalog No. 400 containing engineering and ordering information. *Worldwide sales and service.*

BARCO *Manufacturing Co.*

539C Hough St. (A Chicago Suburb) **Barrington, Illinois**

***In Canada:* The Holden Co., Ltd., Montreal**

The Only Truly Complete Line of Flexible Ball, Swivel, Swing, and Revolving Joints

3- 4	Symposium on subsurface geology, University of Oklahoma.
4- 6	American Petroleum Institute, division of production, Southwestern district spring meeting, Hilton Hotel, Fort Worth.
4- 6	National Association of Corrosion Engineers, Tulsa section, fourth annual short course for pipeliners, Mayo Hotel.
8-11	American Institute of Chemical Engineers, Buena Vista Hotel, Biloxi, Miss.
15-20	American Chemical Society, petroleum division, spring meeting, Statler Hotel, Los Angeles.
16-20	National Association of Corrosion Engineers, ninth annual conference and exhibition, Hotel Sherman, Chicago.
18-20	American Petroleum Institute, division of production, Mid-Continent district meeting, Mayo Hotel, Tulsa.
23-25	Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, Tex.
23-26	American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, and Society of Exploration Geophysicists, joint annual meeting, Sam Houston Coliseum, Houston.
23-27	Western Metal Exposition and Congress, technical sessions, Statler Hotel, Los Angeles.
25-27	Society of Automotive Engineers, national production meeting, Hotel Statler, Cleveland.
28	North Texas Oil and Gas Association, annual meeting, Kemp Hotel, Wichita Falls, Tex.
30-31	Texas Independent Producers and Royalty Owners Association, annual meeting, San Antonio.
30-Apr. 1	Mid-West Gas Association, Broadmoor Hotel, Colorado Springs, Colo.

APR.

7- 8	American Gas Association, research and utilization conference, Hotel Statler, Cleveland.
7- 9	Petroleum Industry Electrical Association, annual convention and exhibit, Shamrock Hotel, Houston.
8-10	American Petroleum Institute, division of production, Eastern district meeting, William Penn Hotel, Pittsburgh.
15-17	National Petroleum Association, mid-year meeting, Cleveland.
20-22	American Petroleum Institute, Division of Transportation, products pipe-line conference, Hotel Muehlebach, Kansas City.
21	Association of Consulting Chemists and Chemical Engineers, Inc., Hotel Belmont Plaza, New York City, symposium and dinner.
21-23	Southwestern Gas Measurement Short Course University of Oklahoma, Norman.
22-24	American Association of Petroleum Geologists, Rocky Mountain section meeting, Casper, Wyo.
22-24	American Institute of Electrical Engineers, southern district meeting, Hotel Seelbach, Louisville, Ky.
24-25	Interstate Oil Compact Commission, spring meeting, Roosevelt Hotel, New Orleans.
26-29	American Institute of Chemical Engineers, Chemical Institute of Canada, joint meeting, Royal York Hotel, Toronto, Ont.
27-28	Independent Petroleum Association of America, mid-year meeting, Jefferson Hotel, St. Louis.

Where in the Well?

HAS THAT WATER TABLE DROPPED?

Water tables used to be pretty much on the level. Then somebody pulled the plug. Now you've got to reach *deep* for your well supply. Today your pump has to be able to come to the table *wherever it is.* That's why the BJ Submersible is your answer. Here is a pump designed to meet the challenge of today's extra deep wells.

BYRON JACKSON CO. *Since 1872* Los Angeles, California

Here's why the BJ SUBMERSIBLE PUMP is the answer to dropping water tables . . .

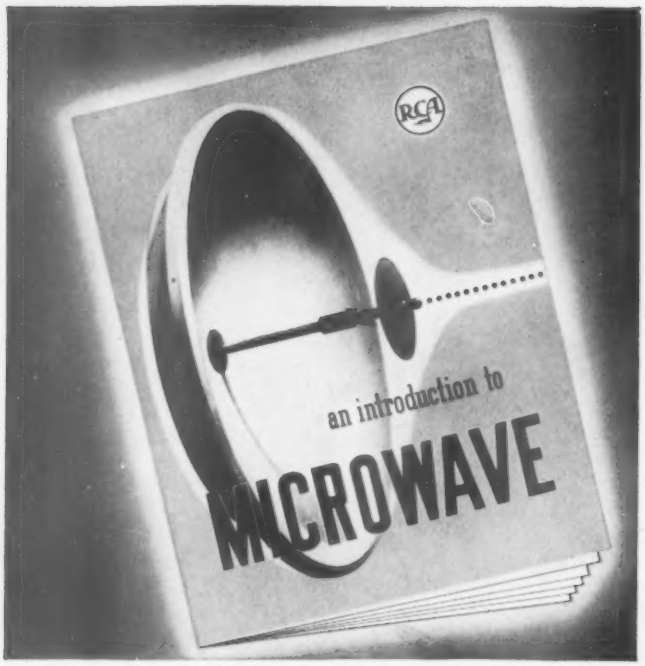
THIS LINE SHAFT PUMP HAS LIMITATIONS

. . . the connecting shaft between surface motor and well pump is a restricting factor. Below certain levels this pump is not economical. At extreme depths it isn't practicable.

THE BJ SUBMERSIBLE IS ALMOST LIMITLESS

. . . this close-coupled turbine pump and sealed electric motor operate completely submerged in the well at any depth. There's no surface motor or long connecting shaft. The pump-and-motor unit is hung on the well pipe and connected by marine power cable to the starting panel at the surface.

You'll find you do better with **BJ** *pumps*



This book answers your questions about Microwave Communications Systems

Have you been wondering whether a Microwave System is the answer to your communications problem? Then you should write, wire or phone for a copy of this brand-new RCA manual. It's free to executives of utilities, pipelines, railroads and other right-of-way companies.

It tells how many companies with far-flung operations and need for "along-the-way" communications are already using microwave. How these companies have found it the most economical type of communications system (channel-for-channel). How in direct day-by-day comparisons they have found it the most reliable of all systems. And it tells how you can go about planning a system that will fit your needs.

MICROWAVE COMMUNICATIONS SECTION
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

Don't Delay—WRITE TODAY!

RCA Engineering Products, Dept. 89N, Camden, N. J.
Please send me your new, free booklet *Introduction to Microwave.*

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Apr. 29-May 1 Natural Gasoline Association of America, annual convention, Rice Hotel, Houston.

Apr. 30-May 1 American Gas Association, transmission and storage conference, Edgewater Beach Hotel, Chicago.

MAY

4- 5 American Petroleum Institute, division of marketing, midyear meeting, Baker Hotel, Dallas.

4- 6 Liquefied Petroleum Gas Association, annual convention, Conrad Hilton Hotel, Chicago.

5- 6 Gas hydrate control conference, University of Oklahoma, Norman.

6- 8 American Society of Training Directors, ninth annual conference, Sheraton Plaza Hotel, Boston.

7- 8 American Petroleum Institute, Rocky Mountain district, Division of Production, spring meeting, Gladstone Hotel, Casper.

11-13 Southern Gas Association, Jung Hotel, New Orleans.

11-14 American Petroleum Institute, Division of Refining, midyear meeting, New York.

13-14 Pacific Coast Gas Association, annual gas supply and transmission conference, Santa Barbara, Calif.

14-23 International Petroleum Exposition, Tulsa.

15-16 International Gas Union, council meeting, Paris, France.

19-22 The Institute of Gas Engineers, ninetieth annual meeting, London, England.

24-27 American Gas Association, production and chemical conference, Hotel New Yorker, New York City.

25-29 American Society of Mechanical Engineers, annual conference and exhibit, oil and gas power division, Hotel Schroeder, Milwaukee.

27-29 Texas College of Arts and Industries, Kingsville, eighth annual short course in gas technology.

28-29 Western Petroleum Refiners Association, regional technical-industrial relations meeting, Broadview Hotel, Wichita.

28-29 Natural Gas and Petroleum Association of Canada, London, Ont.

28-30 West Texas Geological Society, annual field trip, Marfa, Tex.

JUNE

2- 3 American Petroleum Institute, Division of Production, Pacific Coast District, Statler Hotel, Los Angeles.

4- 5 Kentucky Oil and Gas Association, annual meeting, Lafayette Hotel, Lexington, Ky.

7-12 Society of Automotive Engineers, summer meeting, The Ambassador and Ritz-Carlton Hotels, Atlantic City, N. J.

14-18 Canadian Gas Association, Windsor Hotel, Montreal, Canada.

15-19 American Petroleum Institute, Division of Production, midyear committee conference, Hotel William Penn, Pittsburgh.

16-19 American Welding Society, national spring technical meeting, Shamrock Hotel, Houston.

18-19 Western Petroleum Refiners Association, regional technical-industrial relations meeting, Conrad Hilton Hotel, Chicago.

18-19 Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh.

JUNE 29-JULY 3 American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

SUPERIOR HEAT EXCHANGERS

fill the specification for the unusual, as often as for the more conventional.

Salt water can be quite a problem . . . as a coolant used in a heat exchanger. And when it's combined with raw sewage, salt water is just plain rough on some metals.

That particular problem was answered for a major copper producer by SUPERIOR Heat Exchangers with special alloy cupro-nickel linings to retard the corrosive action of the coolant.

SUPERIOR Heat Exchangers are backed by both plant facilities and manpower with the required qualifications to design, fabricate, and guarantee performance *at design ratings* for unusual, as well as for conventional applications.

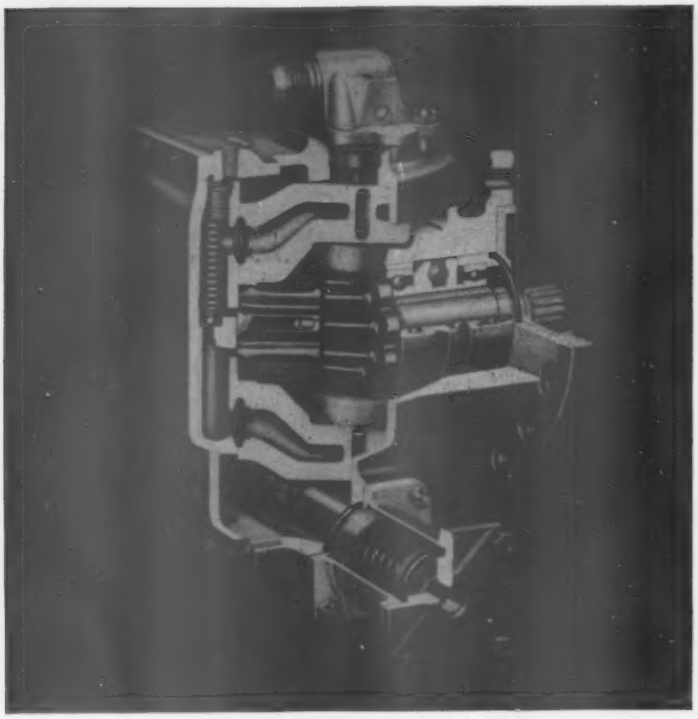
Our Engineering Staff invites your inquiry regarding any proposed application . . . as a basis for a specific engineering recommendation.

This eight page, two-color catalog describes basic design features of heads, shells, and tube bundles. Write today for catalog No. 5011.

for performance you can **BANK** *on*

SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

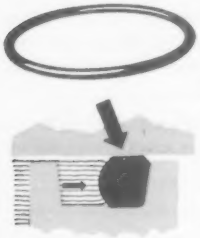
SUPERIOR HEAT EXCHANGERS



Cutaway view showing O-rings. Illustration courtesy Vickers, Inc.

PARKER O-RINGS help pumps set endurance record

THIS IS IT



Cross section drawing of O-ring in groove, sealing under pressure.

Vickers reversible flow 3,000 PSI hydraulic pumps, equipped with PARKER O-rings, recently operated 304,578 pump hours without malfunction for a 12-month period at one airline.

This noteworthy performance—in all sorts of weather—demonstrates the leakproof, long service qualities of PARKER O-rings . . . precision-molded from superior synthetic rubber compounds. Important, too, they provide simplified as well as efficient sealing. Design involves only a small groove to retain the ring. They are economical to use, easy to replace.

PARKER is the one source for *all* standard O-rings for fuel, hydraulic and engine oil services, and for special service O-rings. Ask your PARKER Distributor for Catalog 5100, or write The PARKER Appliance Company, 17325 Euclid Avenue, Cleveland 12, Ohio.

Parker

TUBE FITTINGS • VALVES • O-RINGS

Plants in Cleveland • Los Angeles • Eaton, Ohio • Berea, Ky.

Parker

O-RINGS

ARE STOCKED BY THESE AUTHORIZED DISTRIBUTORS

AKRON, O.
B. W. Rogers Co.
850 So. High St. (9)

BOSTON, Mass.
Irving B. Moore Corp.
65 High Street

BUFFALO, N. Y.
Hercules Gasket & Rubber Co.
327 Washington St. (3)

CHICAGO, Ill.
Air Associates, Inc.
5315 W. 63rd St. (38)
Shields Rubber Co.
564 W. Randolph St. (6)

CLEVELAND, O.
Cleveland Ball Bearing Co.
3865 Carnegie Ave. (3)
Neff-Perkins Co.
2130 St. Clair Ave. (14)

DALLAS, Tex.
Air Associates, Inc.
3214 Love Field Dr. (9)
Metal Goods Corp.
6211 Cedar Springs Rd. (9)

DENVER, Colo.
Metal Goods Corp.
2425 Walnut St.

DETROIT, Mich.
J. N. Fauver Co.
49 West Hancock St. (1)

FORT WORTH, Tex.
Adco Industries
3414 Camp Bowie Blvd.

HOUSTON, Tex.
Metal Goods Corp.
711 Milby St. (1)

INDIANAPOLIS, Ind.
F. H. Langsenkamp Co.
229 E. South St.

KANSAS CITY, Mo.
Metal Goods Corp.
1300 Burlington Ave. (16)

LOS ANGELES, Cal.
Aero Bolt & Screw Co., Inc.
1071 Arbor Vitae Ave.
Inglewood, Calif.
Synthetic Rubber Products Co.
1538 South Eastern Ave. (22)

MIAMI, Fla.
Air Associates, Inc.
International Airport

MILWAUKEE, Wis.
Allrubber Products & Supply Co.
612 So. Second St. (4)

MINNEAPOLIS, Minn.
Van Dusen Aircraft Supplies, Inc.
2004 Lyndale Ave., South (5)

NEW ORLEANS, La.
Metal Goods Corp.
432 Julia St. (12)

NEW YORK, N. Y.
Durham Aircraft Service Co.
5615 Northern Blvd., Woodside, N. Y.
Nielsen Hydraulic Equipment, Inc.
298 Lafayette St. (12)

PHILADELPHIA, Pa.
Goodyear Supply Co.
1506 Latimer St.

PITTSBURGH, Pa.
Shields Rubber Co.
137 Water St. (22)

PORTLAND, Ore.
Hydraulic Power Equipment Co.
2316 N. W. Savier St. (10)

ST. LOUIS, Mo.
Metal Goods Corp.
5239 Brown Ave. (15)

TULSA, Okla.
Metal Goods Corp.
302 North Boston (3)

WICHITA, Kans.
Standard Products, Inc.
650 E. Gilbert (11)

CANADA
Railway & Power Engineering Corp., Ltd.
3745 St. James St.

THE OIL AND GAS
JOURNAL
TULSA, OKLAHOMA

Published every Monday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Oklahoma. Phone 3-6291. Founded in 1902. Name changed to The Oil and Gas Journal in 1910 by Patrick C. Boyle

●

P. C. Lauinger, President; S. H. Rourke, Executive Vice President; Mitchell Tucker, Vice President and Advertising Manager; Hanson B. Pigman, Circulation Manager; Donald W. Wilson, Manager, Industry Census Department; J. Parker Holland, Production Manager.

EDITORIAL STAFF
Kenneth B. Barnes, **Editor;** Henry D. Ralph, **News Editor;** George H. Weber, **Refining Editor,** 500 Fifth Avenue, New York; Dahl M. Duff, **International Editor,** 500 Fifth Avenue, New York; Gerald L. Farrar, **Engineering Editor;** Paul Reed, **Pipe-Line Editor;** W. L. Nelson, **Technical Editor;** Philip C. Ingalls, **Exploration Editor;** C. O. Willson, **Consulting Editor.**

Associate Editors: Lynn M. Nichols, Neil Williams, R. B. Tuttle, and John C. Casper.

District Editors: TULSA: Ted A. Armstrong, Joseph A. Kornfeld, John C. Reidel, William P. Sterne, Robert J. Enright, and John C. McCaslin. HOUSTON, Sterling Building: F. Lawrence Resen. LOS ANGELES, 650 South Grand Avenue: D. H. Stormont. DALLAS, Mercantile Bank Building: Carl F. Hoot. WASHINGTON, D. C. 621 Albee Building: Bertram F. Linz. MIDLAND, TEX., McClintic Building: Roy F. Carlson. CHATHAM, ONT., 35 Stanley: Victor Lauriston.

Editorial Assistants: Carolyn Carter, Tulsa; Martha Allbright, Tulsa, and Wilma Van London, Houston.

Correspondents at Denver, Pittsburgh, Calgary, Columbus, Ashland, Ky., Oil City, Pa., and Mount Pleasant, Mich.

Advertising Offices: TULSA, John D. Reilly, Mid-Continent Manager, and George O. Ruppert, Representative, 211 South Cheyenne, Phone 3-6291; NEW YORK: Charles A. Wardley, **Eastern Manager,** and Robert N. Caird, Jr., Representative, 500 Fifth Avenue, Phone LOngacre, 4-1750; CHICAGO: C. R. Farmer, Manager, Chicago West, and E. S. Klappenbach, Manager, Chicago East, 105 West Madison Street, Phone Central 6-2537; PITTSBURGH: Alfred M. Jones, Manager, 429 Fourth Avenue, Phone Atlantic 1-4835; HOUSTON: John M. Spears, Gulf Coast Manager, Sterling Bldg., Phone CHarter 4626; LOS ANGELES: Donald O. Hanson, Manager, 650 South Grand Avenue, Phone Vandike 0722; ENGLAND: Harry Becker, European Representative, 111 Thorley Lane, Timperley, Cheshire, Phone Ringway 4702.

●

Subscription rate to the petroleum industry, United States and foreign, 1 year, $4.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1953 by The Petroleum Publishing Co.

Member
Audit Bureau of Circulations
Associated Business Papers

JOURNALLY Speaking

Desert Dryness

WELL, it looks as though the jig is up for American oil interests in the Middle East. The final blow has been struck—the most cruel, most disheartening, most devastating obstacle that ever was put in the way of the spread of the American spirit of enterprise and advance of occidental science and culture.

King Ibn Saud is enforcing prohibition in Saudi Arabia.

Sad but true, and it gets sadder as it gets truer. When those American oil men and their families over there run out of their fast-dwindling private stock they won't get any more. Not a drop of anything stronger than camel's milk. It's a horrible picture. We expect to see them flocking home in droves, and the entire oil operation is liable to just wither away.

All Moslems are supposed to be permanently on the wagon, but foreign diplomats and American oil men have always been allowed to maintain their infidel custom of elbow bending so long as they did it by themselves and didn't contaminate the True Believers. But no more in Saudi Arabia. This pleasant bit of extra-territoriality has been permanently ended by personal decree of His Majesty, a devout Defender of the Faith of the Prophet.

Oh, shades of Omar Khayyam! We can skip the book of verse, but how can wilderness be paradise without that jug of wine? Every desert must have its oasis, and when the oasis runs dry life becomes impossible.

If this manifestation of Mohammedan Puritanism is extended to other Islamic countries we predict a rapid withdrawal of all Americans and Europeans from behind the Teetotaling Curtain. Up to now our intrepid oil men, diplomats, and business men have defied all obstacles to bring the blessings of civilization to these ancient lands of the Middle East. They have withstood desert heat, nationalization, and the intricacies of the Arabic language, but this latest barrier may prove insuperable.

In vain the companies may build swimming pools, movie theaters, and air-conditioned homes to make life tolerable for expatriate American oil men. Just imagine laboring all day in a temperature of 130° without being able to look forward to lifting a long cool one at 5 o'clock. Oh, Death, where is thy sting?

There is just one ray of hope. Possibly, just possibly, the American Point-Four Program, which is disbursing considerable quantities of the taxpayers' money to introduce our methods of incentives and productivity to benighted lands, can be diverted from such trivial projects as irrigation works and technological schools and be concentrated on the really vital program of educating these fanatic tribesmen on the value of the cocktail hour as a necessary anesthetic to the trials and tribulations of this Vale of Tears.

Life Can Be Beautiful

WHILE life is getting tougher for American oil men abroad (see above item) it is becoming downright sissified here at home.

For instance, you've probably read about Superior Oil Co.'s new superduper drilling barge, the W. M. Keck, Sr. Never mind all that technical stuff about being able to drill to 25,000 ft. Take note of the accommodations for the crew—air-conditioned bedrooms, individual baths, carpeted floors, mahogany-paneled dining salon, radios, television, and game room. And still they call them "roughnecks." May I borrow your nail file, Butch?

And out in California, Union Oil Co. is glamorizing its drilling rigs and pump stations among the palm-shaded bungalows of the residential areas by planting hedges and flower beds, camouflaging structures to look like movie sets or supermarkets, and soundproofing all installations. The guy who policed a lease used to be known as a grass gooser, but now we suppose he is known as Superintendent of Grounds Beautification.

—Henry D. Ralph

duplex

DUPLEX

.....a good name to remember

Baker DUPLEX Cement Wash-Down Whirler Float Shoe — Product No. 360

WHAT YOU CAN DO WITH BAKER DUPLEX EQUIPMENT

successfully cement liners, combination strings, and perform certain types of two-stage cementing.

cement blank sections of pipe below a perforated section, without any need to use auxiliary equipment.

wash out cavings ahead of the string when setting a liner. Without DUPLEX Equipment you can circulate only through the topmost perforations—with DUPLEX you can circulate clear to bottom.

you can control the amounts of materials used, and (without change) run caustic or oil, then run plastic, in sequences and quantities as desired.

you eliminate the need for auxiliary equipment (such as retainers or retrievable cementers) when you use Baker DUPLEX.

you can use DUPLEX equipment either with or without a liner hanger.

you have complete control of the liner at all times when DUPLEX Equipment is used. The liner can be raised or lowered, and is positively held down in place while cementing.

a bridging ball can be dropped (after cementing) and circulation carried on above the DUPLEX Equipment without disturbing the green cement.

Baker Combination Product No. 383 with a DUPLEX Whirler Float Collar. Cement is held above the Metal Petal Basket.

How DUPLEX Equipment is made

DUPLEX Float Shoes and Collars are similar to other Baker Float Shoes and Collars in most features, but have a female left-hand thread assembly (of drillable cast iron) accurately anchored just above the Back-Pressure Valve. By means of a mating male Left-Hand Square Thread Sub, the cementing string is easily connected to (or disconnected from) the DUPLEX Shoe or Collar.

How DUPLEX Equipment Operates

In simple liner work, a DUPLEX Wash-Down Whirler Float Shoe is connected to the bottom joint and the balance of the liner is run into the well, with the last joint held in slips or clamps. A cementing string of sufficient length then is run to connect the male Left-Hand Square Thread Sub to the female left-hand assembly in the shoe, to form a quick, fluid-tight connection.

The portion of the cementing string above the liner is then run, with the DUPLEX connection carrying the weight of the liner. After cementing, the back-pressure valve prevents any flow-back of cement slurry placed outside the liner. The cementing string is then disconnected by rotating to the *right;* excess cement washed out; and the cementing string removed from the well.

Various combinations of Baker DUPLEX Equipment are used to perform more complex operations, such as cementing behind liners at different levels; cementing above and below cavities; between producing zones; and similar work.

The Baker representative or office nearest you is available to discuss proper use of Baker DUPLEX Equipment in your well completions.

BAKER OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

BAKER

GUIDING, FLOATING AND CEMENTING EQUIPMENT

DUPLEX

How to act without government controls

THE biggest business news in many years is what is going on in Washington right now. With very little talk about it, the Eisenhower administration is putting into effect a philosophy of government-industry relationship which is quite new to the present generation of business executives.

It may take some time before all the implications and ramifications of this policy become apparent. It may take even longer for business men to get used to it.

At first glance it may look like a complete throwback to the classic *laissez faire* (let alone) policy of the nineteenth century. But it isn't. There is to be no return to the ruthless, unenlightened, antisocial business practices which gave capitalism a black eye after the industrial revolution.

The policy is described by a member of the new cabinet as ending "government back-seat driving". The social gains of the past quarter-century will be retained, but government controls and economic planning will be kept in the background. Business will be pretty much on its own to chart its course, to work out the details, and to take the consequences of its actions.

FOR years the oil industry, along with others, has been asking for this new freedom, for an ending of government interference and direction. Now that it has come, some executives are a bit nonplused. They have been looking to Washington for so long that they are not yet fully aware of their own responsibilities and opportunities.

From now on the Government will set certain broad policies and objectives for the performance of industry in such fields as output, prices, wages, and competitive practices. It will be up to business management to find, within the rules of fair play, the ways and means of achievement.

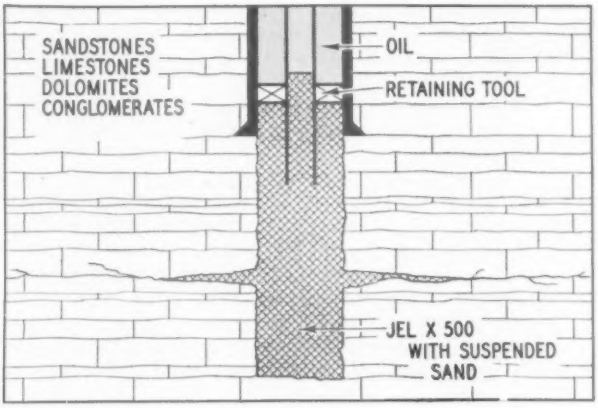
This, in effect, puts industry on trial, for it is a political certainty that if business-on-its-own fails in what the public considers to be its social responsibilities, a vociferous element of the voters will insist on a return to a controlled economy.

OIL men, being traditionally resourceful, are not particularly appalled by the prospect of having to scramble for materials and having their prices set by a free market. But they may not be fully aware of how closely the public is watching them.

The public's interest in the oil industry was not abolished along with government controls. Now, more than ever before, the oil industry must live in a goldfish bowl and act a program of good public relations.

PRODUCTION INCREASED 26 BOPD WITH DOWELL STRATAFRAC

New Dowell Service Combines Advantages of Acidizing and Fracturing in Single Treatment



This well's initial production was 19 BOPD. While the well had not declined, it was not considered good for its location. After various other remedial methods had failed, a Dowell Stratafrac treatment increased oil production to 45 BOPD. Payout time was estimated at 36 days.

Stratafrac treatments using Jel X 500 have increased production from all types of oil bearing formations—limestone, dolomite, sandstone, chat and conglomerate. This service is designed to fracture and acidize the formation in a single operation.

Stratafrac treatments carry suspended sand into existing fractures as an abrading and propping agent. They are also designed to remove paraffin or other heavy hydrocarbons present in the fractures or formation.

Stratafrac treatments are engineered to save you money by holding rig time to a minimum. All materials arrive at the well ready-mixed. No jel-breaker solution is needed following Stratafrac treatments, as the material returns to the well bore as a thin, free-flowing liquid. The well can be returned to production immediately without costly shut-in time.

GET THE FACTS ON STRATAFRAC! Find out how Stratafrac has increased production in many fields. For a more detailed discussion on this new Dowell service, call your nearest Dowell station or write direct to Tulsa, Dept. B11.

DOWELL SERVICE

Acidizing • Jel X* • Electric Pilot • Perfo Jet
Paraffin Solvents • Jelflake* • Bulk Inhibited Acid
Chemical Cleaning for Heat Exchange Equipment.

DOWELL INCORPORATED • TULSA 1, OKLAHOMA
A Subsidiary of The Dow Chemical Company
"First in Oilfield Acidizing . . . Since 1932"
*Service Mark.

Look to **DOWELL**
FOR OIL INDUSTRY CHEMICAL SERVICE

THIS WEEK

PRICES.—OPS removes controls on price of crude, products excepting No. 2 fuel, oil-field machinery, and equipment. . . . Services such as warehousing, transportation rental, and others, also removed. . . . Immediate results are an increase of 15 cents a barrel in Penn-Grade crude and a jump in California crude of from 10 to 50 cents a barrel. . . . Product prices in California increased to cover higher crude-oil costs. . . . Pennsylvania hike considered modest, since Penn-Grade prices had been depressed by sluggish lube-oil market at time controls were imposed. . . . California also was exceptional area because of crude-shortage conditions and difficulty in obtaining supplies. . . .

INTERNATIONAL. — World production leveled off in December, survey shows, registering a gain of only 1,500 bbl. daily over November. . . . Figure of 11,587,000 bbl. daily for December, however, still is 774,500 bbl. daily above the same month of a year earlier. . . . ¶Italian tanker loaded with oil from Abadan docks near Venice only to have the cargo impounded by a court order obtained by Anglo-Iranian. . . . Case second of its kind, first before a non-British court. . . . ¶Russia announces its oil plan is being fulfilled, but says production is lagging in specific areas. . . .

TRENDS.—Primary stocks of four major products on February 14 were about 26,000,000 bbl. greater than on corresponding date last year. . . . Almost 16,000,000 bbl. of the increase was on the East Coast. . . . West Coast stocks were up 10,700,000 bbl., including increases of 6,500,000 bbl. for residual and 4,000,000 bbl. for distillate. . . . Louisiana and Texas Gulf stocks were down 4,800,000 bbl. from last year. . . . Low tanker rates have resulted in heavy movement to the East Coast. . . .

ACTIVITY.—Production of crude and lease condensate averaged 5,553,650 bbl. daily for week ended February 14, up 18,750 bbl. daily . . . ¶Total well completions for the week were off 29 wells to 832 . . . ¶Wildcat completions increased 8 wells to 204 . . . ¶Following two successive weeks for which gains were reported in rotary rigs operating in United States, the total for February 16 dropped to 2,446. . . .

INDUSTRY.—Wildcatting activity in January resulted in 1,008 completions, largest number since October, Journal compilation shows . . . ¶Eugene Holman, Jersey Standard president, and Morris Muskat, of Gulf Oil Corp., awarded Charles F. Rand and Anthony F. Lucas medals at annual meeting of A.I.M.E. . . . ¶Kerr-McGee reveals it has reached agreement with Phillips covering drilling on million-acre lease in Alaska . . . Work will begin this spring. . . . ¶Industry urged to assume responsibility for antipollution work without being forced into it by state or municipal measures or public opinion . . . W.P.R.A. speaker says problem, bad now, is growing steadily worse. . . .

ICE AND SNOW aren't the only obstacles encountered in the winter by oil men working in northern Alberta. Time, too, is a problem, since days don't last long this time of year. Here, a Socony-Vacuum Oil Co., Inc., exploration crew works quickly at putting down a charge of high-velocity dynamite for a seismic shot. Though it's early afternoon, shadows already are lengthening.

GOVERNMENT.—PAD officials, confident that the agency will go out of business June 30, tell House Commerce Committee some of its activities, particularly those concerning aviation gasoline, will have to be continued . . . Warren urges extension of DPA in such a form as to provide for skeletonized PAD . . . ¶Atty. Gen. Herbert Brownell tells House Judiciary Committee that it is up to the Congress whether the tidelands are to become a naval petroleum reserve . . . Truman's order designating the submerged lands as a naval reserve, he contends, was illegal and backed by no one . . . ¶Mobilization Director Flemming says allocation of steel, copper, and aluminum to oil industry will be terminated June 30. . . .

PIPE LINES.—Ten major natural-gas pipe lines to split 140,425 tons of line pipe for second quarter construction. . . . Total allocation is 223,308 tons . . . ¶Lakehead Pipe Line Co. to lay extension of Interprovincial crude line to St. Clair River on International Boundry, with Interprovincial completing the project from the boundary to Sarnia, Ont. . . .

Price Controls Lifted

OPS action freeing crude, all products except No. 2 fuel to be followed by removal of restraints on gas expansion

Bertram F. Linz

WASHINGTON.—Price controls on crude oil, products, and oil-field machinery and equipment have been removed by the office of Price Stabilization.

The only petroleum product not decontrolled was No. 2 heating oil.

OPS also dropped the control of a number of services, including those supplied to commercial and industrial users, and warehousing, storage, dock and terminal, and all transportation services, including the rental of automotive and other transportation equipment.

The first decontrol orders were followed immediately by an announcement by the Petroleum Administration for Defense that all federal restrictions on the extension of natural-gas service will be lifted February 28. These have been in effect 19 months.

Action of the OPS reflected the new administration's drive to free the industrial economy from what Secretary of Commerce Sinclair Weeks has characterized as "government back seat driving." The PAD decision evidenced that agency's frequently expressed intention of eliminating controls on the oil and gas industries as fast as possible.

The OPS action in decontrolling oil prices resulted in immediate adjustments in only two major areas, California and Pennsylvania (See Economics).

Gasoline price may rise . . . The OPS order lifting price controls on crude and products also freed a number of other industries from regulation. Ceilings were retained on No. 2 heating oil because officials saw the probability of increases in price which apparently did not apply in the case of other products, although they warned that gasoline prices could be expected to rise.

Specifically, OPS in effect revoked CPR 13, petroleum products at retail; CPR 17, gasolines, naphthas, fuel oils, and liquefied petroleum gases, natural gas, petroleum case, casing-head gas and refinery gas; CPR 32, crude petroleum; CPR 63, lubricating oils, greases, waxes, and certain other products; and CPR 66, asphalt and asphalt products.

The decontrol order provided that sellers of commodities formerly regulated must preserve all records they have been required to keep by the regulations but need not keep records of future transactions.

Issued in 1951 . . . The gas-limitation regulation, PAD Order No. 2, was issued August 22, 1951, to slow down extension of natural-gas uses in areas where a shortage threatened because of a lack of adequate pipe-line facilities. In lifting the order, Deputy Petroleum Administration J. Ed Warren emphasized it does not mean that pipe-line facilities have now become adequate.

On the contrary, he warned, there is still a lack of facilities in some areas where the potential demand for natural gas will continue to be more than available supplies for some time. This, Warren said, is particularly true of certain areas in the Appalachian and Great Lakes regions.

MSA Problem

Over-expansion of lube-oil capacity in Europe feared

WASHINGTON.—The most important current oil problem of the Mutual Security Agency is the possible over-expansion of European lubricating-oil capacity, the House Commerce Committee was told last week by Cornelius J. Dwyer, chief of the MSA petroleum and petroleum-equipment branch.

Called to discuss the activities of MSA as part of the committee's study of the operations of all the regulatory agencies under its jurisdiction, Dwyer testified that the suits filed by the Department of Justice last August 22 to recover alleged overcharges from American companies selling Middle East crude to Europe was not based on, nor had any connection with, the Federal Trade Commission cartel study and the subsequent grand jury investigation.

MSA's only difference with the companies was over prices, Dwyer disclosed, and the agency has made no charges of cartel activities nor was its decision to suspend the financing of crude oil in any way intended to "punish" the companies for such activities.

Expected pressures . . . "MSA anticipated that the cessation of financing of nonspecialty crude oil would produce pressures by the participating countries on the oil companies which might result in some reduction in the delivered price of crude oil or in the dollar element in its net cost, or in both," the committee was told.

Even before MSA stopped financing this type of crude there was a considerable decline in tanker rates in the spot market and prices have been lowered with the result that oil moving in company tankers is now reaching northwest Europe at a delivered cost from 31 to 36 cents per barrel lower than the landed cost at the time MSA stopped financing, with an even greater reduction on shipments moved in tankers chartered on the spot market.

Throughput to rise . . . Dwyer estimated that refinery throughput in the European countries participating in the Marshall plan will increase from 233,000 bbl. daily in 1938 and 470,000 bbl. daily in 1949 to 1,633,000 bbl. daily for the current fiscal year and 1,840,000 bbl. daily for fiscal 1954.

It was also estimated that European imports during the current fiscal year would include 1,572,000 bbl. daily of crude, 524,000 bbl. of it from American companies, and 220,000 bbl. of products, 135,000 bbl. from U. S. companies.

In fiscal 1954 estimated imports will be 1,769,000 bbl. daily of crude, 613,000 bbl. of it from U. S. companies, and 155,000 bbl. of products, of which American companies will supply 100,000 bbl.

PAD Fights for Existence

WASHINGTON.—Extension of the Defense Production Act in such form as to provide standby authority for at least a skeletonized Petroleum Administration for Defense was urged upon Congress last week by Deputy Petroleum Administrator J. Ed Warren.

Warren made his plea before the House Commerce Committee, currently reviewing the activities of the federal agencies under its jurisdiction, pointing out that the time has arrived when consideration must be given to what will happen when PAD is terminated along with the other emergency defense agencies.

PAD officials are confident the agency will go out of business June 30. However, they explain, some of its activities will have to be continued, particularly with reference to aviation gasoline. These operations could be

handled by expanding the Interior Department's Oil and Gas Division, but it is felt it would be desirable to give the President standby authority to re-establish some form of PAD in the event of another emergency.

Interior Secretary Douglas McKay, who had been invited to appear before the committee, advised that he had not been in his post long enough to have acquired any views that would be of interest but promised to meet with the committee some time in the future.

Warren and other top officials outlined the activities of PAD, emphasizing the necessity for continuing some of them even after the Defense Production Act is terminated. Hearings on continuation of the law were to open before another committee February 24.

Tidelands Testimony

Truman order setting aside submerged lands as naval oil reserve was illegal and unsupported, Daniel tells Senate

WASHINGTON.—Former President Truman's order purporting to make the coastal water belt a naval petroleum reserve in effect did nothing more than transfer to the Navy Department such authority over the "tidelands" oil resources as was formerly held by the Interior Department, Atty. Gen. Herbert E. Brownell held last week.

It is up to Congress to decide whether to revoke the order, Brownell said. Only Congress can create a naval oil reserve within the meaning of the Naval Reserves Act.

Brownell was the first witness scheduled to be heard on tidelands legislation by the House Judiciary Committee. But he told the committee that he, Interior Secretary Douglas McKay, and other government officials would not be prepared to testify on that subject until this week.

The House hearings on legislation to return the offshore lands to the states opened a day later than similar hearings before the Senate Interior Affairs Committee, where a long list of witnesses was waiting to be heard. First to testify before the Senate group were the senators sponsoring quitclaim legislation, headed by Spessard L. Holland of Florida, one of 40 sponsors of such legislation.

Authority challenged . . . While the hearings on both sides of the Capitol are designed to develop the merits of quitclaim legislation versus those of federal administration of the tidelands, they almost immediately developed into an attack on the Truman order.

It was openly charged that Truman had no authority in law to declare the marginal seas a naval petroleum reserve, and knew it when he signed the order.

The attack on the Truman order declaring the tidelands of all 21 coastal states a naval oil reserve was made by Sen. Price Daniel of Texas, who asserted it was issued against the recommendation of several federal departments and with the support of none.

Danel supported the charge with letters from the Department of Justice and the Navy. The Justice Department reported that former Atty. Gen. James P. McGranery objected on legal grounds to promulgation of the order and approved the order, as finally drafted and issued, on the understanding that it did not intend to, nor did in fact or in law, create a naval oil reserve within the meaning of the statute. The Navy reported that no recommendation had been made either favoring or against setting aside the Continental Shelf as a reserve.

The Texas senator also made the point that while the Government had talked of the issue as though it involved only the oil of Texas, California, and Louisiana the claims asserted by the Truman administration extend to all of the lands and all of the resources within the seaward boundaries of the coastal states.

Narrow view . . . He charged that Truman's statement that the Government should not give away the oil in the tidelands and then buy it back "at stiff prices" ignored the fact that oil is not yet produced, that private industry can produce it cheaper than a government agency, and that the Government itself can control the prices charged for it in the event of the emergency which Truman gave as the reason for his action.

Leasing a factor . . . Daniel challenged contentions that the oil industry want the states to have the leasing rights because they feel they can get more favored treatment than from the federal Government. The truth, he said, is that the states demand and get far more from leases and production than the government does on its public lands. On these lands, he said, wildcat leases can be secured for 50 cents per acre, while the states sell their leases to the highest bidder. Texas, he said, averages $20 per acre for submerged lands leases on wildcat acreage, and has received $8,000,000 from leases on approximately 400,000 acres of land. The Government would have received only $200,000 from the same acreage under the Mineral Leasing Act, he declared.

The fact that federal leases are so

First I.P.E. Petrochemicals Committee Makes Plans

For the first time, the International Petroleum Exposition will take official notice this year of the booming petrochemicals industry. Shown here designing a proposed exhibit for the I.P.E. Hall of Science are members of the petrochemical-exhibit committee. Left to right they are Dr. Isaac Drogin, director of research, United Carbon Co., Inc., Charleston, W. Va.; Leroy Donald, manager, chemical sales division, Lion Oil Co., El Dorado, Ark.; R. M. Leader, Phillips Petroleum Co., Bartlesville; John A. Britton, Jr., director, Enjay Co., Inc., New York; and Miller W. Conn, manager of market development division, Phillips, Bartlesville, who is committee chairman. Robert A. Douglass, division sales manager Ethyl Corp. Tulsa also is working with the committee in setting up the initial display.

WATCHING WASHINGTON

Bertram F. Linz

Seeing Without Looking

IF laboratory studies of the National Bureau of Standards work out, it will soon be possible to determine the corrosion rate of tanks, pipe lines, and other underground structures without even looking at them.

The bureau's studies demonstrated that the rate of weight loss of steel corroding normally in soil can be measured electrically, without the need for visual inspection.

The measuring technique is based on a relation established by other investigators who showed that the current in a corrosion cell, formed by local differences in electrical potential at the surface of the metal, can be expressed in terms of the values of anodically and cathodically (positively and negatively) applied direct current, from an external source, that will just reduce the cell current (corrosion current) to zero.

If this method proves practicable in the field as well as in the laboratory, it would have several advantages in addition to obviating the need for excavating the underground structure.

Controls Study Under Way

President Eisenhower is having an exhaustive study made of price, wage, and materials controls with a view to firming up policy on continuation of the Defense Production Act but in the end may leave the final decision to Congress.

The only major issue is whether, upon the termination of the price-control law April 30, the President shall have standby authority to reimpose them in the event of another crisis.

The President is represented as personally opposed to standby controls and Chairman Wolcott of the House Banking Committee takes the same position, but Chairman Capehart of the Senate Banking Committee is strongly urging their adoption, however. Since the authority to reimpose controls would likely be permissive rather than mandatory, Eisenhower might leave the decision to Congress so as not to become involved in a controversy.

There is little or no disagreement on the necessity for continuing controls on the distribution and use of a few very scarce materials, such as oil-country tubular goods, and Congress is expected to provide for this in extending the act.

All phases of the control situation will be considered during hearings which will be started by Capehart February 24.

Treaty in Jeopardy?

Imposition of limitations on the importation of residual fuel oil, as sought by a dozen members of Congress to protect the coal industry, might jeopardize the Venezuelan trade agreement.

One of the demands of Venezuela in the making of the present agreement was that import quotas be abandoned. The Venezuelan Government would not look with favor upon such restrictions, but on the other hand there is nothing to prevent Congress from adopting them if it sees fit.

The Venezuelan agreement provides that the United States shall not impose any quantitative restrictions on imports from Venezuela except agricultural and fisheries products.

Synthetic-Rubber Plants

The Reconstruction Finance Corporation is required to make recommendations to the President next month for disposition of the Government's synthetic-rubber industry, and is expected to submit a plan for selling the plants to private operators.

Such a recommendation would be in line with the administration's plans for divesting the Government of its industrial operations, already marked by announcement that the Mississippi River barge operations of the Inland Waterways Corp. will be sold.

Over the past few years sale of the rubber plants has been recommended periodically but Congress has always found reason to continue them in government hands, largely because of national-defense needs. It is believed, however, that Congress now will be ready to go along with a disposal program because synthetic rubber has firmly established a position in the rubber industry.

much cheaper gave rise to the entire tidelands controversy, Daniel charged, and it is the applicants who filed for federal leases who will cash in if the submerged lands are not restored to the states.

In the view of Navy officials, the executive order did not of itself create the naval petroleum reserve of which Truman spoke but merely transferred to the Navy such limited authority over the submerged lands as had previously been exercised by the Interior Department.

The position of the Interior Department was that the President had no authority to deal with any but public lands and that the underwater oil reserves had never been considered as public lands. Both the Navy and Interior took the position that only Congress could create a navel reserve out of the submerged lands.

Although it is viewed as a foregone conclusion that a quitclaim bill will be reported out on both sides of the Capitol, both committees will afford an opportunity for opponents of state ownership to be heard. The hearings are expected to run for 2 or 3 weeks.

Imports Warning

Firms must slow down or face fight in Congress

WASHINGTON.—Failure of the importing companies to slow down the entry of foreign oil may result in a drive by domestic producers for readoption of the quota system abandoned with consummation of the Venezuelan trade agreement.

In a report to President Charlton H. Lyons last week, Russell B. Brown, general counsel of the Independent Petroleum Association of America, pointed out that legislation to regulate imports of residual fuel already has been introduced by more than a dozen members of Congress from the coal-producing states.

Brown also pointed out that consideration of renewal of the Reciprocal Trade Agreements Act, which expires June 12, will throw open the whole question of foreign-trade policy.

"These developments make it clear that the import problem not only as to oil but generally, and in various aspects, will be before the new Congress at an early date," Brown said.

Cites A.P.I. policy . . . Recognition by the American Petroleum Institute of the policy that imports should be used only to supplement domestic production "should certainly encourage the solution of these problems within the industry," Brown commented.

"I would like to leave this to the

good services of the important companies, but until something more definite comes from them I do not believe it would be safe," he declared. "The importance of oil raises the question as to whether the nation should be required to rely upon the uncertainties of individual action. Some argue that this implementation should be fixed by law.

"It may be that a final solution of this problem will require the recognition and participation of division of Government as well as all who may have concern with excessive imports of oil," Brown concluded.

Pipe Allocations to End

Supply of tubular goods to meet drilling requirements should be adequate by the end of the year, Warren says

WASHINGTON.—New wells drilled in this country during the next 3 years will not exceed 50,000 annually under present economic incentives, and by the end of this year the supply of tubular goods should be adequate to meet requirements.

This view of drilling and materials prospects was disclosed by the Petroleum Administration for Defense last week, following announcement by Acting Mobilization Director Arthur S. Flemming that allocation of steel, copper, and aluminum for the oil, gas, and other industries will be terminated June 30.

After the second quarter, it is now anticipated that priorities will be confined to defense needs of a few scarce and critical items which it has been indicated will not include oil-country tubular goods.

Open market . . . With the announcement that allocations will be ended, Flemming put the Controlled-Materials plan on an "open-end" basis, permitting producers of the three metals to sell on the open market to any customer any output remaining after CMP tickets have been honored, and allowing consumers, whether or not they hold tickets, to buy additional material if they can locate it.

PAD officials said, however, there is little likelihood of additional tubular goods being available and, in fact, they expect that operators will have to continue to use conversion and foreign pipe for some months to come.

"Operators probably will not have to use as much of the higher-priced pipe in 1953 as in 1952," Deputy Administrator J. Ed Warren said, "and for the long haul there is ground for believing that the short supply situation in oil-country tubular goods that has persisted most of the time since World War II, barring an all-out emergency, will shortly come to an end."

Drilling estimate . . . The estimate that 50,000 wells a year will be the top activity over the 1953-55 period was made by a panel of consultants from the industry called in by PAD to advise on the outlook in light of new information on availability of tubular goods.

The consultants had before them a recent survey by the National Production Authority indicating that the current program for construction of new tubular-goods facilities will increase the production this year by 35 per cent over 1950-51, with a further increase to 45 per cent next year. In 1955, the increases will be 54 per cent for facilities and 51 per cent for production.

In figures, NPA placed the 1953 production at 2,215,000 tons, of which 1,896,000 tons will come from present mills, 194,000 from new mills, and 125,000 from conversion.

No conversion is included in figures for 1954 and 1955. The 1954 output is estimated at 2,638,000 tons, of which 2,134,000 will be from present mills and 504,000 from new plants, and the 1955 output is estimated at 2,747,000 tons of which 2,183,000 will be from present mills and 564,000 from new mills.

If pipe is available in the quantities foreseen by NPA, Warren said, it will be sufficient to let the domestic oil industry drill in the neighborhood of 50,000 wells a year.

Should have enough . . . "The petroleum industry both here and in the free-world nations abroad should have enough tubular goods over the next several years to permit them to continue the development of oil resources to meet all demands during the current defense effort," he declared.

Warren indicated there is no expectation that the domestic industry will reach the goal of 55,000 wells set for this year by PAD and NPA, but he pointed out that target was established on the then necessary assumption that this number of wells would be drilled only if the industry was given the necessary materials.

Not only will the materials not be available, he said, but it would be impractical for the industry under present economic conditions to maintain a reserve fully adequate for war needs.

"Good job done" . . . "As it is," Warren said, "the industry has done a good job of increasing its reserve productive capacity for crude to provide a cushion on which we could fall back in face of the sharp increase in demand that would certainly come with all-out war. Obviously, though, we do not have a reserve that would take care of all the increased demands.

"If war does come, it will be essential to maintain a normally high drilling rate throughout the war if we are to be in a position to meet essential needs. We will simply not be able to afford the kind of cut in drilling that we experienced in World War II."

Warren pointed out, also, that in event of war there would be competition for the use of facilities for production of oil-country tubular goods, which also can be used for production of rockets, shells, and other munitions.

The only safeguard is an assurance of sufficient mill capacity to meet all requirements, and PAD is now encouraging further study of wartime requirements in an effort to insure that the country will not be caught short.

With materials controls slated for termination, PAD will not attempt to establish any new expansion goals although, until the agency is shut down, it will continue to study future oil needs and lay its results before the industry as a guide.

PAD Division Revamped

WASHINGTON. — The Petroleum Administration for Defense has abolished its foreign materials branch and transferred its duties to a new foreign-coordination office under the supervision of J. E. Brantly, assistant deputy administrator.

Monty R. Garrison, Jr., who headed the foreign-materials branch, has been appointed foreign-coordination officer.

The shift of these activities was purely technical. Heretofore, the foreign-materials branch was a part of the materials division, which is chiefly concerned with domestic matters, but all its work was in connection with the foreign division. The transfer, PAD officials said, will merely put the work in the foreign division, where it properly belongs.

Major Product Exports Up

WASHINGTON.—Exports of major oil products averaged 262,300 bbl. daily during the week ended January 23, more than double the daily average of 130,300 bbl. of the preceding week, according to figures compiled by the

Petroleum Administration for Defense.

While shipments of aviation gasoline declined by nearly one-half, those of the 4 other products jumped sharply with distillate topping the 100,000-bbl. mark.

Details of the week's movement, compared with the preceding week, and averages for the 4 weeks ended January 23 are shown in the accompanying table, in thousands of barrels daily.

	Week ended Jan. 23	Week ended Jan. 16	Average 4 weeks
Aviation gasoline	19.5	35.5	29.9
Motor gasoline	43.2	17.3	35.9
Kerosine	13.1	...	6.7
Distillate	109.7	42.0	62.1
Residual	76.8	35.5	47.1
Total	262.3	130.3	181.7

Gas Lines Given Steel

Ten major projects allocated a total of 140,425 tons for second quarter; for six it is their first consignment

WASHINGTON.—Ten major natural-gas pipe-line projects, six of them just starting, will split 140,425 tons of line pipe between them for second quarter construction.

Another 525 smaller projects, including gathering lines, distribution lines, other facilities, and maintenance, repair, and operations will get 82,883 tons of a total of 223,308 tons of pipe allocated to the gas industry last week by the Petroleum Administration for Defense.

The 10 major projects, which will provide an aggregate daily capacity of 2,240,000 M.c.f., will be constructed at an estimated cost of $348,346,118.

The six projects which will get their first allocations of steel next quarter are:

... **El Paso Natural Gas Co.:** to transmit an additional 400,000 M.c.f. daily to markets in New Mexico, Arizona and California, for completion in the first quarter 1954 at an estimated cost of $88,140,274; given 5,000 tons.

... **Pacific Gas & Electric Co.:** for looping sections of the 34-in. line from the Colorado River to California markets, for completion in the first quarter 1954 with a capacity of 150,000 M.c.f. daily at a cost of $22,335,000; given 23,423 tons.

... **Utah Natural Gas Co.:** gathering and transmission facilities from Clear Creek field to Provo, Utah, for completion in the third quarter 1953 with a capacity of 50,000 M.c.f. daily at a cost of $4,000,000; given 7,081 tons.

... **East Ohio Gas Co.:** looping of existing 20-in. line between Toledo and Cleveland, Ohio, for completion in the fourth quarter 1953 with a capacity of 75,000 M.c.f. daily at a cost of $9,160,970; given 11,317 tons.

... **Chicago District Pipe Line Co.:** looping of transmission lines from Joliet to Chicago, for completion in the fourth quarter 1953 with a capacity of 495,500 M.c.f. daily at a cost of $4,550,000; given 6,201 tons.

... **Houston Pipe Line Co.:** looping of part of present lines from two Texas producing fields to the Houston market area for completion in the first quarter 1954 with a capacity of 100,000 M.c.f. daily at a cost of $2,710,000; given 4,000 tons.

The four other major projects, which already have received allocations for part of the pipe required, are:

... **Southern Natural Gas Co.:** looping and extension of system for additional supplies to its entire market area for completion in 1954 with a capacity of 350,000 M.c.f. daily at a cost of $77,675,600; given 36,479 tons.

... **Tennessee Gas Transmission Co.:** looping of part of existing system for completion in the fourth quarter 1953 with a capacity of 406,000 M.c.f. daily at a cost of $130,755,590; given 31,758 tons.

... **Ohio Fuel Gas Co.:** compressors, pipe lines, and facilities for a 138,000-M.c.f. expansion of underground storage for completion in the second quarter 1953 at a cost of $4,531,200; given 5,983 tons.

... **New York State Natural Gas Corp.:** transmission line from Cameron County, Pennsylvania, to Armstrong, Pa., for completion in the third quarter 1953 with a capacity of 77,000 M.c.f. daily at a cost of $4,487,484; given 9,183 tons.

Graveyard for Pumping Jacks

These ancient pumping jacks, which served many years on the McDonald lease of Cities Service Oil Co. in Texas, have been retired in favor of newer equipment. Installation of the new jacks, and removal of these, became necessary after the beginning of a water-flood operation.

Resources Conference Put Off

WASHINGTON.—The White House conference on natural resources originally scheduled for March 25-27 has been postponed until next fall to allow more time for planning.

The meeting, when held, will be under the sponsorship of Resources for the Future, a non-profit organization formed to work for adoption of the recommendations of the Paley Commission for the conservation of oil, natural gas, and other resources.

A council of conference sponsors is now being formed, to be representative of organizations concerned with resource development.

Reporting Rules Eased

WASHINGTON.—Requirements for reports on the status of major construction jobs in the oil and gas industry were eased last week by the Petroleum Administration for Defense.

Hereafter, it was announced, operators will be required to fill out only parts of Section I of Form PAD-26, Supplement, which calls for a brief statement covering percentages of completion in various categories and sched-

uled completion dates. The three other sections of the form, calling for more detailed information on projects using more than $500,000 in materials and equipment, will not have to be filled out.

For oil operators, Items 3 and 4 of Section I, covering receipt of critical equipment and Class B machinery and equipment, have also been eliminated, and for gas operators all except Items 2 and 6 have been discontinued.

It will be necessary, hereafter, for operators to file monthly only one copy of the report, instead of the previous four.

Gas-Hearing Change

FPC examiners now accepting evidence of field prices in their hearings, but they still don't have to consider it

WASHINGTON. — The Federal Power Commission is permitting the introduction of evidence of field prices of natural gas in hearings before its examiners but with no assurance it will be considered in setting rates for pipe-line companies.

Recent hearings in a rate case involving Panhandle Eastern Pipe Line Co. brought the issue to the front when the trial examiner rejected motions of the FPC staff counsel to deny admission of testimony the company sought to introduce on prevailing field prices, involving recognition by the commission of the conservation laws of states which allow prevailing field prices for natural gas.

The staff counsel appealed from the ruling and his appeal was denied by the commission although in some past cases it had upheld an examiner's decision rejecting evidence on field prices.

Background . . . Since 1941 the commission has followed a theory of rates based on original cost, and Panhandle was attempting to show that during the last 10 years the pipe-line companies have gradually been forced to get out of production because this theory does not give consideration to the risks and hazards which they contend entitle them to more than a utility rate of return on the gas they themselves produce.

The companies say that the average price allowed pipe lines for their own gas is one-half cent or less per 1,000 cu. ft. as compared with from 7 to 11 cents for gas delivered to them by independent producers.

The controversy over the Panhandle testimony has been going on since 1950, when the company presented evidence on the "attributed well-head value" of natural gas which it produces in Oklahoma and Kansas and "average well head" price of gas produced in Texas, and current prices being paid for gas produced in the 3 states.

FPC counsel consistently objected to the introduction of this testimony and last month, after a heated interchange with the trial examiner, made an appeal to the commission.

During the course of the argument between Robert Russell, FPC counsel, and Trial Examiner Emery J. Woodall, the latter asserted he is not bound by previous commission decisions rejecting field-price testimony in the Pittsburgh and Canadian River Gas Co. cases.

As trial judge, Woodall said, he is required to receive all pertinent evidence and that the law "requires that every element of every decision in every case be based upon a proven record of facts."

Majority ruling . . . In announcing its rejection of Russell's appeal the commission expressed the opinion that the evidence "should remain in the record for consideration in the ultimate decision of the proceedings." It emphasized, however, that at this time it was deciding no more than that the evidence should be admitted.

GULF COAST

Pollution Is Worse

Waste treatment is a permanent and growing job; it should be ranked with safety or industrial hygiene, W.P.R.A. told

F. Lawrence Resen

BEAUMONT. — Pollution control is an unproductive and time-consuming burden, and it is growing worse. But industry would be shortsighted to "play ostrich" and stall for time while hoping for the best.

Industry must face the facts and take corrective steps, K. E. Mills, technical adviser on waste disposal to Pan American Refining Corp., Texas City, told the regional meeting here of the Western Petroleum Refiners Association.

The magnitude of the problem is such that to merely fulfill the more obvious requirements in municipalities and industry would cost 4½ billion dollars; to accomplish a fairly complete cleanup on a national basis would require about 20 billion, Mills said.

In spite of the enormity of the problem, he declared, the most common industry attitude toward pollution is the tendency to hedge. A second reaction is one of sustained silence. The third attitude is that of explaining the complexity of plant processes, lack of analytical know-how, and the vast amount of research needed before taking steps toward abatement—without mentioning the specific problem.

Mills said there is some justification for industry hesitancy. Manpower and equipment are scarce; plant facilities are crowded; states and localities disagree on what steps are needed; there is a lack of standards to guide either government or industry.

Problem summarized . . . In spite of this, he declared, industry cannot retreat. Outlining the present problem he said that:

. . . Satisfactory disposal of industrial waste has become a permanent or long-range segment of industrial activity which it is no longer prudent to circumvent.

. . . Industry's position on pollution is being damaged by policies of silence, concealment and other subterfuge reaction.

. . . Industry is well-advised to recognize that pollution is fundamentally related to national resources and civic welfare and therefore implies ethical considerations.

. . . Most rapid and efficient progress in abatement will be realized when industry polices itself by sustained voluntary action.

. . . As proper attitude by industry gains momentum, the disagreeable alternatives of aroused public opinion, hasty legislation, or injunctive procedure become unnecessary.

. . . Abatement action by industrial and control agencies reaches optimum position by application of scientific approach.

. . . Intelligent industry policy includes waste treatment as an integral part of corporate structure. It is not relegated to an outside category but is given full position with safety, industrial hygiene, and similar activities.

Crude Prices Hiked

West Coast firms follow California Standard in boosting crude, product prices; Penn-Grade crude posting also up

THE price of crude jumped last week in the West Coast and Penn-Grade producing regions — the two areas squeezed hardest by the now-defunct price controls.

On the West Coast, Standard Oil Co. of California assumed the initiative by hiking prices of both crude and wholesale product prices in California.

Union Oil Co. quickly met the advance, which in general ranged from 10 cents per barrel for 14°-gravity crude and below to 50 cents for 35° and above. Richfield Oil Co. and General Petroleum Corp. followed suit, making the advance retroactive to the morning of February 16, effective date of Standard's new posting. Other purchasers were expected to take similar action before the week was out.

The 1.6 cent increase in wholesale motor fuel and aviation-gasoline prices made by Standard likewise was being met by other major and independent refiners. Service-station price advances were not uniform, but motorists in California, Washington, Oregon, Idaho, Nevada, and Arizona were paying 2 to 2.5 cents more for gasoline.

Other wholesale product price increases included 1.6 cents per gallon for kerosine, 1.8 cents for stove and diesel fuels, and 10 cents per barrel for heavy fuels.

New crude prices . . . The new price for most fields reflected about a 2-cent per degree gravity increase above the 10-cent base raise. At Wilmington field, for example, the new schedule includes $2.34 for 20°-20.9°, up 21 cents; $2.69 for 25°-25.9°, up 31 cents; and $3.07 for 31°-31.9°, up 42 cents.

New postings for Ventura Avenue crude range from $2.62 for 26°-26.9° to $3.13 for 33°-33.9° gravity. Those in Cuyama Valley are $2.55 for 27°-27.9° and $3.32 for 40°-40.9°, and in the Coalinga fields of the San Joaquin Valley they range from $1.80 for 12°-12.9° to $3.43 for 40°-40.9° gravity.

Both Standard and Union filed with the Office of Price Stabilization last spring for crude and product price increases comparable to the ones they made last week. When price controls were lifted it was generally anticipated the companies would make the upward adjustment.

Increase overdue . . . Standard's president, T. S. Petersen, stated "petroleum prices on the West Coast should have been increased long ago to assure adequate supplies; these are very necessary and long-overdue adjustments. Inadequate ceiling prices have been the cause of the shortage of California crude oil.

"Prices for both crude oil and finished products should be at a level sufficiently high to stimulate West Coast production to provide more local supplies, to encourage development and production of marginal properties, to stimulate more secondary-recovery activity, and to attract adequate supplemental supplies from outside sources as needed."

Richfield's president, C. S. Jones, struck at the lack of oil-conservation laws in California as the real cause for the upward price swing. To bring this situation fully to the attention of the West Coast, Richfield will run full page ads in 149 West Coast newspapers.

"We are just as concerned as all our consumers about the gasoline prices which are now in effect," Jones declared. "These prices are necessary under existing conditions of supply, demand, and cost, but they might not have been necessary if the industry had been permitted to develop its oil reserves properly in the past.

Oil lost . . . "Because California has not had proper oil-conservation laws governing the recovery of oil from our known reserves, there has been left in the ground—lost for all time—enough daily production of oil to have equalled the millions of barrels of oil we now must import," he declared.

All not pleased . . . Producers of heavy crudes were displeased with the 10-cent advance. They believe that heavy crudes have not been restored to the relationship they held prior to 1948 and 1949, when cuts totaling about 70 cents per barrel were made. The new schedule they claim distorts this differential even more.

Penn-Grade hike . . . In Pennsylvania the Joseph Seep Purchasing Agency of South Penn Oil Co. announced an increase of 15 cents a barrel in prices posted for Pennsylvania Grade crude oils, effective February 16. Other West Pennsylvania refiners have met the increase.

The new price schedule calls for $4.40 a barrel for crude from the Bradford and Allegany districts, delivered to Bradford Transit Co. or National Transit Co. pipe lines. Middle-district oil in the National Transit Co. line is also quoted at $4.40.

Southwest Pennsylvania crude, delivered to Southwest Division of National Transit Co., is listed at $3.97 a barrel.

Pennsylvania Grade oil in Eureka Pipe Line and in Buckeye Pipe Line, mostly from West Virginia, is posted at $3.91 a barrel.

Ashland Oil and Refining Co. announced an increase of 10 cents a barrel for Zanesville Pennsylvania Grade crude, bringing the price up to $3.20.

Increase modest . . . The actual increase of 15 cents a barrel for most of the Pennsylvania Grade crude is well under the increase in ceiling prices, requested in March of last year before the rapid decline in lube-oil prices. The Pennsylvania Oil Producers Committee filed a petition with the Office of Price Stabilization showing that the net cost of producing Bradford crude had increased 72 cents a barrel since 1948 and that the price was 75 cents less than the posting of $5.00 a barrel in 1948.

Pennsylvania Grade crude prices dropped rapidly in the early months of 1949, due to a slump in lube-oil prices that started late in 1948. Bradford crude was cut to $3.27 a barrel on May 11, 1949 but started back up the following month. A series of eight small increases brought the price back up to $4.25 on December 9, 1950. The price freeze in January 1951 stopped the advance 75 cents short of the level that had existed before low lube prices forced the cut in 1949.

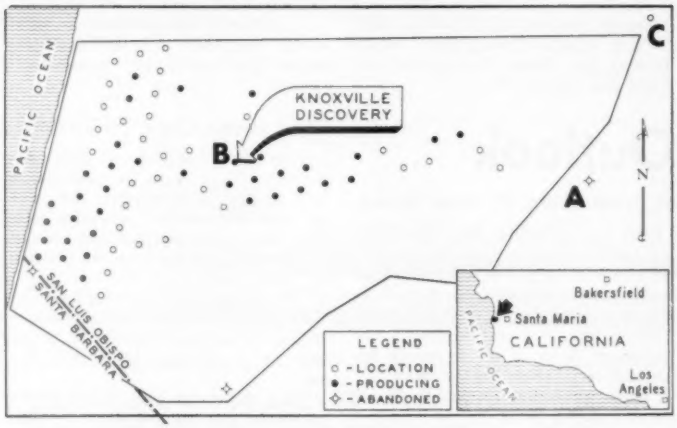
CANADA

Topping Plant Started

COLEVILLE, Sask. — Construction has begun here on a 5,000-bbl. topping plant which will process crude from Coleville field.

The plant is being financed and built by Refinery Operators, Ltd., which will operate the plant under an agreement with Royalite Oil Co., Ltd., and Canada Southern Oils, Ltd. Royalite and Canada Southern jointly own the major interest in Coleville field, which now has 60 wells producing 14°-gravity crude.

The plant will produce gasoline, fuel oils, tractor distillate, and asphalt. Storage capacity will total 30,000 bbl.



Guadalupe Prospects

Reserves of deeper Knoxville pay, discovered in November predicted to equal or exceed those of older Sisquoc zone

D. H. Stormont

LOS ANGELES. — Discovery of a deeper pay in Guadalupe field on the Pacific Ocean about 11 miles west of Santa Maria establishes this field as one of the more important low-gravity crude reserves in the state.

Only one well has been completed in the new 3,000-ft. Knoxville sand, of Cretaceous or upper Jurassic age. From dry holes and control gained in completing 35 producers in the 2,600-ft. Sisquoc zone (lower Pliocene), however, the deeper pay is believed to have a productive area of at least 1,000 acres.

The Sisquoc pool has been proved over an area of almost 3,000 acres. Its thickness, however, is about 60 ft. as compared with the 160 ft. of saturation found in the Knoxville discovery well. Because of its greater thickness and the more prolific production, discovery of the new pay is regarded as the most significant development in the field's history.

Discovery by Continental Oil Co. in May 1948, Guadalupe had received only four additional producers by January 1950. All had initial productions of 100 bbl. or more but quickly settled to about 10 bbl. daily. The low gravity of the crude, ranging from around 9° to 12° A.P.I., plus a high sand cut, also tended to make the operation unattractive. In addition during this period California was so flooded with heavy crude that prices were cut approximately 70 cents per barrel.

Lease sold . . . In January 1950, Thornbury Drilling Co. acquired the large LeRoy lease and five producers from Continental. Reconditioning of four of the five wells caused their production to increase to a sustained per-well output of 90 bbl. daily. This better production, plus a greatly improved market for low-gravity crude, resulted in 11 new wells being completed in 1951. During last year the total was raised to 35.

This development extended Sisquoc production over an area 3 miles long and 2 miles wide, all on the single lease Thornbury had acquired from Continental. Output of the 29 wells, which were on steady production during last December, averaged about 72 bbl. daily per well.

Development thus far has been on 10-acre spacing so that approximately 300 wells will be required to develop the area now considered proved. In all likelihood, however, development eventually will be reduced to 5-acre spacing because of the low gravity and viscous nature of the crude.

Knoxville discovery . . . Last fall a ¾-mile east outpost, Thornbury 1-152 Union Sugar (A on map), was drilled to 3,723 ft. It found the Sisquoc wet. The Knoxville likewise contained water, but some oil saturation was found.

Based on this finding Thornbury started G-4 LeRoy (B on map), near the center of the proved area, about 2 miles west of 1-152 Union Sugar and well up-structure on the southeast dipping monocline. Drilled to 3,287 ft., the test was completed in November as a 60 bbl. Sisquoc producer at 2,685-2,761 ft. In January it was recompleted as a dual Sisquoc-Knoxville well at 2,685-3,287 ft., producing 300 bbl. daily.

Core analysis and other studies show the 60-ft. Sisquoc zone to have an average porosity of 39 per cent and a permeability of approximately 4,800 md. Ultimate recovery from this pay has been estimated at about 60,000,000 bbl., based on a productive area of 3,000 acres with 5-acre well spacings.

Porosity of the Knoxville, according to W. H. Geis, Thornbury vice president, is 36 per cent and permeability is 4,000 md. Because of the greater sand thickness Geis believes reserves of the new zone probably will equal or exceed those of the Sisquoc.

Limits unproved . . . How much further to the northeast production will extend is yet to be proved by the drill. Much light on this subject will be shed by the wildcat (C) shortly to be started 1 mile northeast of production.

A 20-well drilling campaign has been announced by Thornbury for this year, the first of which was completed last week. It is planned that all will be dual completions.

Trans Mountain Stock Sold

LOS ANGELES.—Union Oil Co. of California last week disclosed it has sold its 100,000 shares in Trans Mountain Pipe Line Co. for $42.25 a share. The company did not reveal to whom the stock was sold.

The Trans Mountain line now is under construction. It will move Alberta crude to the Puget Sound area, where several new refinery projects already are under way.

Union's sale of its interest in the line followed the company's decision not to build a refinery in Washington, which it had been considering.

Drilling Crews Organized

LOS ANGELES.—A drive by an A. F. of L. Teamsters Union local to unionize drilling crews of contractors in California has resulted in the local winning the right to represent crews of three contractors.

Elections, by mail balloting, were either under way or scheduled with the employes of about 12 other drilling contractors.

According to officials of the Teamster's Western Warehouse and Produce Council, the oil-well drillers and helpers division of Local 986 won the right to represent Terminal Drilling Co., Shamrock Drilling Co., and Dunlap & Graham, Inc. Balloting was in progress among employes of Herbeli Drilling Co., International Drilling Co., Pacific Drilling Co., Petrie Drilling Co., and Pioneer Drilling Co.

Elections were scheduled for Fred Johnston Drilling Co., McAteer Drilling Co., Holmes Drilling Co., Victory Drilling Co., Gober Drilling Co., and McMullen Drilling Co.

Water-Flood Outlook

California fields are different from those in other areas, but flood-pot tests indicate they're suitable for flooding

D. H. Stormont

LOS ANGELES.—Unprecedented market demand and the high cost of new-pool discoveries are focusing the attention of California operators on the possibilities of secondary recovery, and particularly the feasibility of water-flooding operations.

An outline of current work being done in water-flood research was presented here last week by Norris Johnston and N. van Wingen, of Petroleum Technologists, Inc., Montebello, before a meeting of the petroleum branch of the American Institute of Mining and Metallurgical Engineers.

Reporting on studies of more than 200 large core samples from 15 California pools, the authors said actual field results and corresponding laboratory data are still insufficient to warrant any large-scale deductions. For the same reason, they declared, no empirical factor is available for correlating lab data with subsequent field performance of full-scale floods carried to economic depletion.

But, they said, their studies indicate that California pools, while differing from those of other areas, respond to water injection in a manner generally comparable to that of the eastern reservoirs.

Even so, they continued, experiences gained from floods east of California cannot be applied in California too well because:

... **California sands** are generally thicker, and are frequently soft and argillaceous.

... **California crudes** often are heavier and are asphaltic.

... **Water supplies** in California often are insufficient.

In discussing their data, the authors said much of the flood-pot recovery was obtained in spite of oil viscosities much higher than the 30 cp. commonly mentioned in Mid-Continent discussions as a probable practical upper limit for floodable oil.

As shown in the table, recovery exceeding 1,400 bbl. per acre flood has been recorded. In some cases, they said, the oil formed a bank, with some being recovered by viscous drag in the subordinate phase of the flood. Reservoir analysis, they said, suggests a conformance factor of 0.4 to reduce laboratory to probable field practice.

Other conclusions reached by the authors included these:

... **There is no reason** to believe that 1,800 cp. is the upper limit of floodable viscosity. Oil with such a viscosity has been recovered with as encouraging results as lighter oils, often with comparable water/oil throughput ratios.

... **Water/oil ratios** did not differ in magnitude from similar values in lab tests on Mid-Continent and eastern sands.

... **Residual oil saturation** was comparable with flood-pot values found in Mid-Continent and eastern laboratories for lighter oils.

... **Oil recovery** was in proportion to the amount of oil originally present, as was residual oil saturation.

... **The likelihood** of bank formation also was determined by the amount of oil initially present.

... **The initial oil** saturation below which flood-pot tests did not recover appreciable oil was exceptionally low, while initial water saturation above which oil recovery was negligible was surprisingly high.

... **Per cent oil recovery** from flood-pot tests cannot be predicted from ordinary core-analysis data. Some physical and chemical factors other than those controlling porosity, permeability, and saturation are quite important.

... **Sands have yielded** appreciable flood-pot recovery with oil mobility as low as 0.6 md./cp. and excellent recovery was obtained at 1.8 md./cp.

... **California sands** do not appear to have less-favorable permeability variation than sands east of the Rockies that have been flooded successfully.

... **Flood-pot tests** have been successful in both paraffin and asphaltic base pools.

... **Pretreatment of water** is important in flood-pot tests, but probably is more important in field practice.

... **Effective permeabilities to oil** in the "bank" were reasonably high, though they were extremely low in the "watered-out" region.

... **Effective permeabilities to water** in the "bank" were very low, and often remain low even in the "watered-out" region.

Long Beach Cites Oil Income

LONG BEACH, Calif.—Figures prepared by Long Beach for presentation at a hearing in Washington this week on tidelands quitclaim legislation show that the city has received cash revenue of $165,532,261.72 from its offshore oil operations.

The statistics were prepared by City Atty. Irving M. Smith who is testifying before the subcommittee of the Senate Interior and Insular Affairs Committee.

They show that $140,495,364.66 of the total was realized from the contract with Long Beach Oil Development Co. and $25,036,897.06 under the agreement with Richfield Oil Corp. The city also has acquired oil equipment valued at $32,700,000. Gas supplied to the city free and resold to private consumers adds more millions of dollars to the grand total.

Accuracy of the figures was vouched for by Murray Courson, principal oil accountant of the Harbor Department.

Separate Trial Opposed

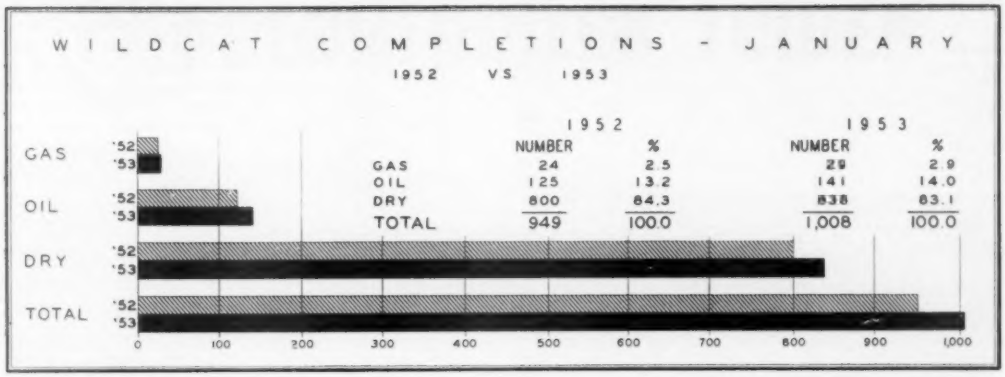
LOS ANGELES. — Federal Judge J. M. Carter has been asked by the antitrust division of the Department of Justice to deny the request of the Conservation Committee of California Oil Producers for a separate trial in the Government's antitrust suit against seven major West Coast oil companies.

In a 150-page brief filed with the federal District Court, W. C. Dixon, chief of the division's West Coast office, declared the committee and the companies were engaged in the same conspiracy—controlling the oil business from well to filling-station pump.

In answering the government's complaint, filed in May 1950, the committee contended it should not be tried along with the seven companies and denied it had engaged in any conspiracy.

Government and company attorneys are scheduled to argue objections to about 190 unsettled interrogatories of the 1,702 questions posed by the antitrust division before Judge Carter on April 14.

The seven companies are Standard Oil Co. of California, The Texas Co., Tide Water Associated Oil Co., Richfield Oil Corp., General Petroleum Corp., Union Oil Co. of California, and Shell Oil Co.



Wildcatting Tempo Up

West Texas, Rocky Mountains lead active January campaign in which 1,008 tests were finaled—highest since October

John C. McCaslin

OPERATORS kicked off the wildcatting new year in January by completing 1,008 tests, the highest number since last October.

Wildcat completions in the United States accounted for 25.4 per cent of total completions (for a summary of total completions see page 251), and were up 6 per cent over those finaled in January 1952.

Both new discoveries and dry holes showed substantial gains over the previous month and January last year. Of the month's 1,008 completions, 141 were oil discoveries (83 of them in Texas alone), 29 found gas, and 838 were recorded as dry holes. Footage drilled in January totaled 4,629,832 ft., up considerably over the previous month.

Completions and footage by states, together with a comparison of figures for the corresponding period of 1952 and December 1952, may be found in the accompanying tables.

All areas active . . . The new year began with an active exploratory program in all important wildcat areas, particularly in West Texas and the Rocky Mountain area. The biggest increase in wildcat completions and footage drilled is reported in the Rocky Mountain area.

At present the most active area in West Texas is in Andrews County, while Bottineau County, North Dakota, is the center of exploratory interest in the Rocky Mountain-Williston basin area. Beaver County, Oklahoma, continues to be the most active area in the Anadarko basin. Activity surged in the Denver-Julesburg basin, particularly in western Nebraska and in the more central areas.

West Texas . . . Development work in Andrews County highlighted Permian basin operations during the month.

Magnolia Petroleum Co. completed its north and south confirmation wells offsetting its Magutex discovery, and Phillips Petroleum Co. established either a new Devonian structure or a long northwest extension to Magutex.

Magnolia 1-CA Fasken, about equal distance southeast of Magutex, was completed as a Devonian discovery. Humble Oil & Refining Co. 1-Q University completed as a long east extension in the Devonian. Humble's well had the Devonian some 60 ft. high to the same marker at Magutex.

In Ector County, Texas Gulf Production Co. 1 Headlee finished as a 643-bbl. Ellenburger discovery following several weeks of testing. This well had several drill-stem tests which did not indicate flush production, but its log showed a big 237-ft. pay section.

Canyon-reef-lime stone production was established in northwest Lynn County at Dan Auld 1 Timmons, which flowed as high as 40 bbl. per hour.

Denver-Julesburg basin . . . In Colorado, a southeastern Weld County discovery may prove to be one of the major developments in the basin, indicating possible commercial production further

January's Wildcat Successes, Failures, and Footage

	Total	Oil	Gas	Dry	Footage
Kansas	99	14	2	83	368,463
Oklahoma	71	8	2	61	310,248
Texas	470	83	15	372	2,220,183
North Central	199	41	4	154	721,350
West	78	12	0	66	497,661
Panhandle	10	2	0	8	45,160
East	25	1	0	24	119,712
Gulf Coast	72	13	5	54	527,899
Southwest	86	14	6	66	308,401
Louisiana	43	8	2	33	361,597
North	20	1	0	19	125,654
South	23	7	2	14	235,943
Mississippi	19	4	0	15	144,030
Arkansas	10	1	0	9	44,973
Nebraska	15	0	0	15	77,210
Rocky Mountains	64	2	1	61	347,693
Dakotas	8	0	0	8	38,605
New Mexico	17	3	1	13	111,760
California	55	3	1	51	250,555
Tri-States	92	12	2	78	193,694
Others	45	3	3	39	160,821
Total January 1953	1,008	141	29	838	4,629,832
Total January 1952	949	125	24	800	4,295,709
Total December 1952	852	102	25	725	3,986,018

*Incl. 13 condensate wells: Okla. 1, W. Tex. 1, Panhandle 2, SW. Tex. 7, S. La. 2.

Comparison of Wildcat Completions and Footage by States

	1953		1952	
	Total comp.	Total footage (1,000 ft.)	Total comp.	Total footage (1,000 ft.)
Kansas	99	368	92	363
Oklahoma	71	310	70	359
Texas	470	2,220	486	2,366
North Central	199	721	225	774
West	78	498	64	373
Panhandle	10	45	9	52
East	25	120	19	117
Gulf Coast	72	528	85	636
Southwest	86	308	84	414
Louisiana	43	362	29	234
North	20	126	13	56
South	23	236	16	178
Mississippi	19	144	19	136
Arkansas	10	45	9	36
Nebraska	15	77	17	53
Rocky Mountains	64	348	22	138
Dakotas	8	39	0	0
New Mexico	17	112	10	63
California	55	251	40	203
Tri-States	92	194	118	233
Others	45	160	37	112
Total United States	1,008	4,630	949	4,296

toward the central and deeper portion of the basin.

Twin Oil Co.'s 2 Cuykendall, 35 miles northeast of Denver, is still testing after flowing oil at the rate of 3 bbl. per hour from the "J" sand. This wildcat represents the most southwesterly extension of the producing trend through northeastern Colorado. The area, which approaches the deeper portion of the Denver-Julesburg basin, previously has not had a great deal of attention.

Nebraska . . . One of the best discoveries in Nebraska in recent years was made by The Chicago Corp. and Republic Natural Gas Co. southwest of Dorman pool in Cheyenne County. The new strike may prove to be of the Huntsman or Dorman caliber. It will be completed in the "D" sand, which had a 15-ft. saturated pay zone, an excellent section for this portion of the basin. The well is located 4.2 miles southwest of closest production at Dorman field, and 3½ miles south of Ohio Oil Co.'s recent discovery at 1 Runge west of Dorman field. The latter was offset by two dry holes.

Wyoming . . . One of the most important discoveries on the east side of the Powder River basin in several years was finaled for 975 bbl. of oil per day from the Newcastle in the Wildcat Creek area of Weston County.

Big Horn-Powder River Corp. and J. D. Sprecher's wildcat, 1 Mary Wakeman, is 1 mile southwest of the South Clareton area, where most of Weston County's development drilling has been centered for the past year. The new strike has shifted exploratory interest from the southwest and west sides of the basin into the Clareton area. Operators are drilling an offset to the discovery well.

Saskatchewan . . . One of the best Williston basin discoveries in Canada to date was made in the Mississippian by Tide Water Associated Oil Co. at 1 Forget, Central Saskatchewan. The wildcat, located 50 miles north of Divide County, North Dakota, flowed at the rate of 150 bbl. of oil per day on tests. The discovery reported the best initial on a test made of any well in the Canadian portion of the Williston basin. The discovery is located 50 miles southwest of Tide Water and Imperial Oil Co., Ltd.'s Wapella area discovery in East Central Saskatchewan, which is pumping at the rate of 100 bbl. daily from the Lower Cretaceous.

Mississippi . . . Northeastern Mississippi's Paleozoic Warrior basin area received its second new gas field with the completion of Shell Oil Co.'s 1 Mrs. Lee Harrington in Monroe County.

Both Muldon field, opened last year, and Shell's new Aberdeen field produce from the Mississippian-Chester. Carter Oil Co. has an indicated discovery 11 miles west in Chickasaw County, also a possible Paleozoic strike. These new discoveries have added incentive for further exploratory work in northeastern Mississippi and northwestern Alabama in an area which is one of the country's largest untested areas of regional updip wedging of porosity and permeability in known reservoir rocks.

Oklahoma panhandle . . . A new oil discovery or extension 3 miles northwest of Greenough pool in Beaver County gives promise that 1953 will be another big year in the northwestern portion of the Anadarko basin.

J. M. Huber Corp.'s 1 Potter was completed in the Oswego lime for 218 bbl. of oil in 5 hours. The discovery is located 1 mile southeast of Morrow sand gas-distillate production in the 11-well Light-Liberal field. A sizable productive area might result with the expected development program between the new Huber well and Greenough pool. All Beaver County pools to date have proved to be of limited extent, with the exception of Light field.

Oil Men Honored

A.I.M.E. awards medals to Holman, Muskat at banquet

LOS ANGELES. — Eugene Holman, president of Standard Oil Co. (N. J.), and Morris Muskat, technical assistant to Gulf Oil Corp.'s vice president in charge of production, were

E. HOLMAN

M. MUSKAT

honored here last week by the American Institute of Mining and Metallurgical Engineers.

At the society's annual banquet, Holman was presented the Charles F. Rand medal, given for "distinguished achievement in mining administration." Muskat was presented the Anthony F. Lucas medal, awarded in recognition of "distinguished achievement in improving the technique and practice of finding and producing petroleum."

Both awards were presented by M. L. Haider, of Standard Oil Co. (N. J.), and outgoing A.I.M.E. president.

The citation accompanying Holman's medal credited the Jersey Standard executive with "distinguished contributions" in geology which promoted conservation, farsighted development of foreign oil, able administration of a major oil company, and efforts "in behalf of greater understanding among men so that our country and others might enjoy greater prosperity and the hopes of lasting peace."

Muskat's citation credited him with "distinguished achievements in the application of mathematical concepts to the science of petroleum engineering," contributions to the knowledge of flow of oil and gas in sands and to the producing patterns of well groupings, and efforts in advancing the science of geophysics.

DEBUTANIZER TOWER

Debutanizer Tower being transferred from the dock to the derrick barge.

Derrick barge transporting the tower to the ship for loading.

Debutanizer tower being lowered into cradle aboard the S. S. Volunteer State.

for Britain's Largest Refinery

Modernization and expansion of the Esso Petroleum Company Ltd. refinery at Fawley, England began in June 1950. This 126,000-bbl. per day refinery, the largest in Europe, was officially opened September 14, 1951 and went on stream fully in November. Construction continues, however, on additional facilities to expand and improve the line of products.

The 10-ft. by 88-ft. 9-in. debutanizer tower above was built at our Birmingham plant for installation at the Fawley refinery. It was shipped by rail from Birmingham to the port of New Orleans. The remainder of the trip to Europe was made on the ship "Volunteer State."

This Chicago Bridge & Iron Company debutanize tower is a typical example of the many types of steel plate work we are equipped to design and build. We have equipment for x-raying and stress relieving to code requirements and pickling and painting fabricating steel by the Horton phosphoric acid process. Our engineers, shops and erection crews are backed by the years of experience and complete facilities that it takes to build refinery structures to engineering specifications . . . *and do it right!*

There are many Horton steel plate structures for the petroleum industry. Among them are Horton Floating Roofs, Hortonspheres, Hortonspheroids, Hemispheroids, Horton Vaporspheres and Vaportanks, Hortondome Roofs, and elevated steel tanks. For further information, estimates or quotations on any of these structures, write our nearest office. There is no obligation on your part.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Midland Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 C & I Life Bldg.
Los Angeles, 17.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3.....1615-1700 Walnut Street Bldg.
San Francisco, 4.....1544—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Comprimo N.V., Amsterdam—O, Netherlands
Compagnia Tecnica Industrie Petroli, Rome, Italy
Wheatoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Sociedade Chibridge de Construcoes Ltda., Av. Franklin Roosevelt, 194, Sala 704-C, Rio de Janeiro, Brazil

This "TRIO" sounds new notes on pipe economy

1 Wide Range of Wall Thicknesses (¼- to ½-inch)

2 Wide Selection of Diameters (6 to 36 inches)

3 Long Lengths (up to 50 feet)

Armco Welded Steel Pipe is in close harmony with most line pipe specifications. It offers important advantages to help save money, metal and time.

With the wide range of diameters and wall thicknesses available you can match job requirements *exactly!* There is no need to compromise on capacity or strength—or purchase costly extra metal not warranted by the job.

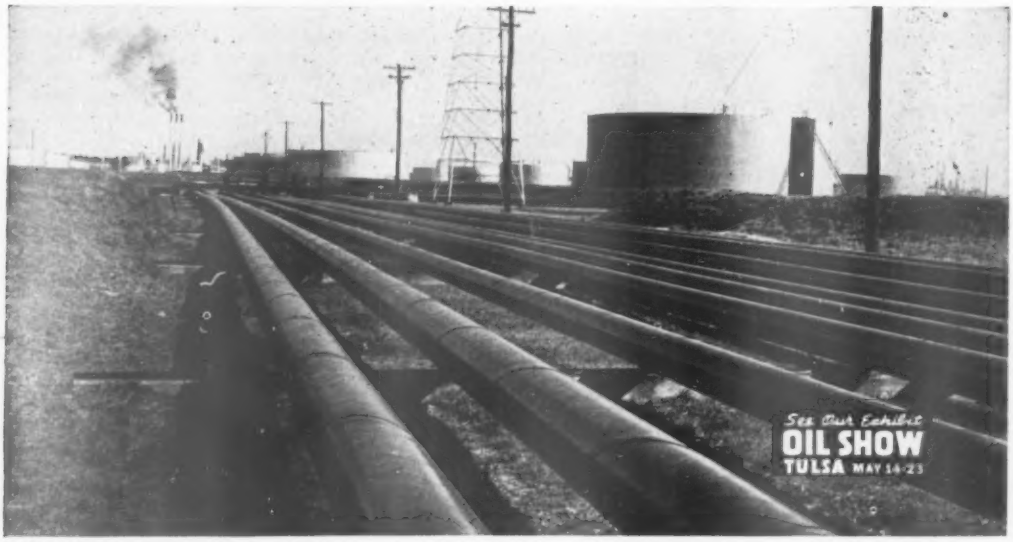
The long, 50-foot lengths of Armco Welded Steel Pipe save you time and labor. There are fewer sections to haul and handle, fewer field joints to make. And even these joints are made quickly with the specially-prepared ends that simplify and speed field welding.

Another advantage of Armco Pipe is its flexibility—slack loops and cold bends are no problem.

Use Armco Welded Steel Pipe with complete confidence for line pipe requirements in the production, transportation and processing of natural gas and wherever else you need dependable piping. Write for complete data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1963 Curtis Street, Middletown, Ohio. 201 KOMH Building, Tulsa, Oklahoma. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO WELDED STEEL PIPE

ARMCO



SOUTHWEST

Texas Cuts Allowable

High stocks, high rate of imports dictate reduction now rather than drastic cuts later, Thompson tells hearing

F. Lawrence Resen

AUSTIN.—The Texas Railroad Commission last week set the state's March allowable at 3,118,751 bbl. daily, a cut of 118,405 bbl. daily from the allowable in effect on February 14.

High imports and high above-ground product stocks were given by Chairman Ernest O. Thompson as the reasons for the reduction. A continued high rate of production now, he said, probably would require drastic cuts in production in coming months.

The commission ordered a producing pattern of 21 days for the state as a whole and 18 days for East Texas field.

Importers' plans . . . In discussing the imports situation, Thompson read summaries of replies from the major importing companies to printed questions submitted by the commission asking for the companies' importing plans for the coming year.

A check of 12 companies reporting on their importing plans showed that their combined imports will average 637,914 bbl. daily during 1953. Average product imports, by nine companies, were shown as 258,998 bbl. daily.

A breakdown of crude imports by companies showed these figures, in barrels daily: Gulf Oil Corp. and Standard Oil Co. of California, 107,000 each; Standard Oil Co. (N. J.), 98,000; Socony-Vacuum Oil Co. 92,800; Sinclair Oil Corp., 68,000; The Texas Co., 62,400; and Atlantic Refining Co., 56,600.

Texas oil, Thompson said, is confronted with the threat of being supplanted by foreign crude. It does not seem fair, he continued, that this condition should develop after Texas has built up a reserve producing ability of 600,000 bbl. daily for defense purposes and in light of the fact that Texas statutes forbid production in excess of market demand.

California problem . . . The question of California operators' plans to meet their crude-oil requirements came up with the request of Alvin Lane, attorney for West Coast Pipe Line Co., for permission to question F. W. Bartlett, director of Socony-Vacuum Oil Co., whose West Coast subsidiary, General Petroleum Corp., is planning construction of a refinery in Washington which will operate on Canadian crude.

Bartlett said the shortage of crude now is such that imports are being obtained on a temporary basis from Venezuela, Colombia, and the Middle East. Shipment of West Texas crude to the Gulf Coast and thence to California, he said, would be prohibitive in cost.

Replying to Lane's question as to whether General Petroleum would use West Texas oil if it were available on the West Coast through a pipe line, Bartlett said such a development was a long way off and that it is difficult now to predict the situation 2 years hence.

Austin Cadle, representing Standard Oil Co. of California, said in answer to Lane's questions that his company has been importing crude from Saudi Arabia, Borneo, and Sumatra. The now-building Trans Mountain Pipe Line will ease the situation in California and permit curtailing most of his company's overseas imports, Cadle added.

Announcement of the new March allowable followed a canvass of operators, which showed that most favored a producing schedule of 22 days for the state generally with 19 for East Texas. Advocates of this plan included Gulf Oil Corp., The Texas Co., Shell Oil Co., Cities Service Oil Co., Sinclair Oil & Gas Co., Magnolia Petroleum Co., and Phillips Petroleum Co. Sun Oil Co. asked for a 23-19 day schedule, and only Humble Oil & Refining Co. requested a cut to a 20-19 schedule.

Following is the March allowable by districts.

ALLOWABLES BY DISTRICTS

	Bbl. daily
District 1	44,531
District 2	159,645
District 3	501,386
District 4	267,746
District 5	51,663
District 6	
Outside East Texas	132,085
East Texas field	249,720
District 7-B	129,749
District 7-C	208,696
District 8	1,018,571
District 9	263,056
District 10	91,903
Total	3,118,751

MID-CONTINENT

Westgate-Greenland Sold

KANSAS CITY, Mo.—Natural Gas & Oil Corp., a wholly owned subsidiary of Mississippi River Fuel Co., has acquired a controlling interest in Westgate-Greenland Oil Co., Kansas City.

Natural Gas & Oil said it purchased 96 per cent of 1,187,365 shares of common stock in Westgate-Greenland for about $6,842,316, or at $6 per share. Company officials said money is available for the remaining shares.

Drilling Contract Sealed

OKLAHOMA CITY, Okla.—Kerr-McGee Oil Industries, Inc., revealed last week that it has worked out an agreement with Phillips Petroleum Co. to do exploration work this spring on a 1,000,000-acre block of leases in Alaska issued by the Interior Department to Phillips and Northern Development Co.

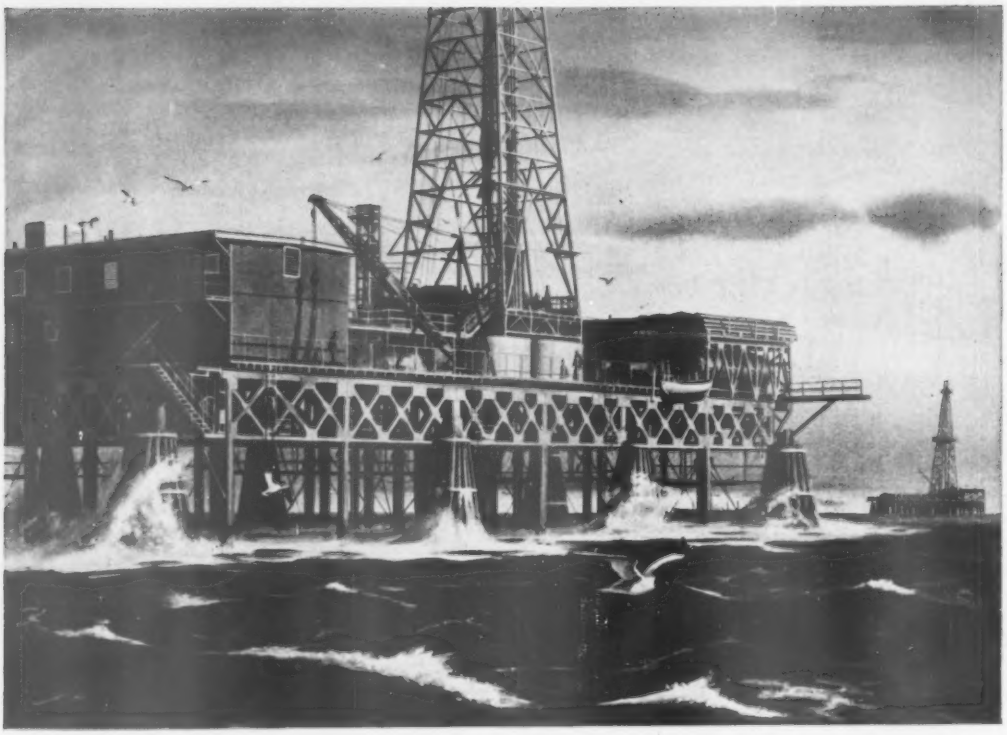
Tom Seale, chief engineer for Kerr-McGee, is reported recently to have returned from a preliminary investigation of the area.

The acreage, comprising more than 500 leases, is in the Katalla-Yakataga area along the southeast shore of the Gulf of Alaska, about 50 miles east of the ice-free harbor of Cordova. Issuance of the leases was approved by the Interior Department following the negotiation of a development contract acceptable to the department between Phillips and Northern. *(The Oil and Gas Journal, February 16, page 94).* Northern is a partnership of William T. Foran and Ben G. Gellenbeck who acted for the lease applicants and developed the plan for operation.

Kansas Tax Measure Pushed

TOPEKA, Kans.—A measure which would levy a flat 3 per cent gross-production tax on oil and gas produced in Kansas is expected to be introduced in the House of Representatives here.

Revenues from the tax would be earmarked for the state high-school educational system. The tax would be in addition to present ad valorem levies on oil in the producing counties so as not to disturb the present tax system in those counties. Stripper wells producing less than 2 bbl. daily would be exempt.



OVER OR UNDER...LAND OR SEA...BROWN & ROOT'S EXPERIENCE CAN SAVE YOU MONEY . . . TIME!

Four decades of diversified experience in heavy construction and engineering has developed a "know-how" for Brown & Root which can be invaluable to you. Over the years Brown & Root's technological developments have provided important savings of time and money for many clients.

Regardless of your interest, be it in finished products—fabricated parts or basic materials Brown & Root can help you. Centralized responsibility coordinates engineering and construction. This plus loyal personnel will save your firm time . . . money.

If your company contemplates new construction or plant expansion a call from you will place Brown & Root plant planning experts at your disposal.

BROWN & ROOT, Inc. *Engineers • Constructors*

P. O. BOX 3, HOUSTON 1, TEXAS

CABLE ADDRESS — BROWNBILT

BROWN-BILT

Associate Companies:— BROWN ENGINEERING CORP. • BROWN & ROOT MARINE OPERATORS INC.

Production Steady

New records established in several countries in December fail to raise world crude output due to slumps elsewhere

Dahl M. Duff

NEW oil-production records were established in several countries in December, although total output of the non-Communist world showed virtually no change from the previous month.

Venezuela, West Germany, and Qatar in the Persian Gulf all hung up new high records. However, these increases plus a small gain in the United States were offset by declines elsewhere, particularly in the Middle East.

The December total crude output of the free world averaged 11,587,200 bbl. daily, an increase of only 1,500 bbl. daily over the total for the previous month. Compared with December 1951, the gain was 774,500 bbl. daily, or 7.2 per cent. This percentage gain over the previous year is in line with the smaller world-wide production increases now generally forecast in the industry.

Non-Communist foreign production in December showed a drop of nearly 28,000 bbl. daily from the daily average in November. Compared with the year-earlier month, the December total represented an increase of 9.5 per cent.

Preliminary figures give the United States an output of 6,516,000 bbl. daily for December. This total is 29,000 bbl. daily over the revised figure for November of 6,487,000 bbl. daily. United States production in December was 5.4 per cent over December 1951.

WORLD CRUDE-OIL PRODUCTION
(In thousands of barrels daily)

Country—	Dec. 1952	Nov. 1952	Dec. 1951
W. Hemisphere:			
Argentina	70.0	71.0	70.0
Bolivia	1.3	1.3	1.6
Brazil	2.3	2.2	1.5
Canada	182.0	187.0	126.5
Chile	3.0	2.9	2.1
Colombia	104.0	103.4	101.2
Cuba	0.1	0.1	0.1
Ecuador	8.0	8.0	7.8
Mexico	215.9	211.0	215.1
Peru	44.5	45.0	45.4
Trinidad	58.5	58.5	57.2
Venezuela	1,861.0	1,814.5	1,776.4
Total	2,550.6	2,504.9	2,404.9
Europe and Africa:			
Algeria	1.3	1.3	0.4
France	6.5	6.4	6.0
F. Morocco	2.0	1.9	1.5
W. Germany	37.6	36.8	28.8
Italy	2.1	1.9	0.5
Netherlands	12.3	13.0	11.7
Egypt	46.0	46.5	45.8
United Kingdom	1.1	1.1	1.1
Total	108.9	108.9	95.8
Middle East:			
Bahrein	30.0	30.2	30.2
Iran	23.0	23.0	38.0
Iraq	514.3	485.3	192.4
Kuwait	710.2	792.4	673.0
Qatar	81.2	79.4	58.5
Saudi Arabia	732.8	764.1	853.8
Turkey	0.3	0.3	0.4
Total	2,091.8	2,174.7	1,846.3
Other Asia:			
British Borneo	105.0	105.0	102.5
Burma	2.5	2.5	2.0
India	6.0	6.0	5.0
Indonesia	192.0	182.5	160.0
Japan	5.6	5.7	5.8
New Guinea	4.9	4.7	4.9
Pakistan	3.9	3.8	3.3
Total	319.9	310.2	283.5
Total foreign less Russia*	5,071.2	5,098.7	4,630.5
United States	6,516.0	6,487.0	6,182.2
Total free world	11,587.2	11,585.7	10,812.7
Est. Russia:†			
Austria	55.0	55.0	43.0
Romania	80.0	80.0	90.0
Russia	985.0	985.0	860.0
Other Communist	24.2	24.2	28.9
Total	1,144.2	1,144.2	1,021.0
World total	12,731.4	12,729.9	11,833.7

*And other Communist-controlled areas.
†And satellite areas.

Figures are from reliable reports in the industry or official government sources. Data for Russia and Eastern Europe are based on competent estimates; no authentic information is available on month-to-month production in these areas. Completely current reports also are lacking for certain countries of Southeast Asia. Data for earlier months have been revised where necessary.

Other Communist areas comprise China, Czechoslovakia, Hungary, Poland and Yugoslavia.

TREND OVER THE LAST YEAR

	Western Hemisphere less U. S.	Middle East	Total foreign less Russia and E. Europe
January	2,432.3	1,832.8	4,653.5
February	2,438.8	1,860.1	4,692.0
March	2,437.8	1,996.5	8,813.8
April	2,459.6	2,090.8	4,933.2
May	2,527.6	2,142.1	5,059.9
June	2,517.8	2,208.9	5,117.6
July	2,495.0	2,126.1	5,018.7
August	2,425.5	2,091.7	4,921.7
September	2,417.8	2,168.2	4,994.8
October	2,455.8	2,175.1	5,047.2
November	2,504.9	2,174.7	5,098.7
December	2,550.6	2,091.8	5,071.2

Venezuela . . . Venezuela's production increase was 46,500 bbl. daily, or about 2.6 per cent. Though relatively small when compared to some of the gains made in many of the larger oil-producing countries a year or two ago, it was the largest increase of any country in December.

Venezuelan production turned back up last October following a sharp slump during the summer months. The last previous production record in Venezuela was during May when the country's fields turned out an average of 1,844,400 bbl. daily. The December total bettered this by nearly 17,000 bbl. daily.

Production in Venezuela by weeks during December was: week ended December 1, 1,800,000 bbl. daily; December 8, 1,773,900 bbl. daily; December 15, 1,855,700 bbl. daily; December 22, 1,877,900 bbl. daily; and December 29, 1,901,900 bbl. daily. The December 29 figure was a record for the country on a weekly basis and was the first time Venezuelan production has gone above the 1,900,000-bbl. daily mark.

Colombia . . . December production in Colombia, averaging 104,000 bbl. daily, excluding condensate, remained a few thousand barrels below the record levels of last summer. One difficulty was the wet season cooling the export pipe lines and curtailing flow. Production by concessions in Colombia during December was: Empresa 34,724 bbl. daily; Barco, 26,978 bbl. daily; Yondo, 36,136 bbl. daily; Cantagallo, 461 bbl. daily. Dificil, 1,269 bbl. daily; Velasquez, 4,477 bbl. daily.

Canada . . . Canadian oil production fell back 5,000 bbl. daily. However, the 182,000-bbl. daily output in December was still above what some had expected during the winter months when movements through the Interprovincial line are cut back.

Mexican oil production showed a slight gain but continued at about the

same level as in the year-earlier month.

Europe . . . In Europe, Italy's small crude production continued to increase. Most of this crude is coming from Azienda Generale Italiana Petroli's Cortemaggiore field where a new gasoline plant was finished last summer. West Germany's production of about 37,600 bbl. daily represented the latest high in an oil output that has climbed steadily for the last several years.

Middle East . . . The two largest oil-producing countries of the Middle East—Saudi Arabia and Kuwait—both showed substantial drops in production in December. This was attributed to slackening oil demand in Europe, reportedly abundant crude stocks in this part of the world, and the greatly expanded production of Iraq over the last year.

Saudi Arabian production fell back more than 31,000 bbl. daily to a daily average of 732,800 bbl. Saudi Arabia's December output was 121,000 bbl. daily, or 14.2 per cent, below that of December 1951. Kuwait December production declined 82,000 bbl. daily, or more than 10 per cent from the previous month. The December daily average of 710,200 bbl. was only about 37,000 bbl. daily over the total for December 1951.

These decreases were only partially offset by another increase in Iraq's output, and as a result, the total for the Middle East fell near 83,000 bbl. daily to the lowest level since last August. The increase in Iraq production amounted to 29,000 bbl. daily above November. Iraq's December output was 167 per cent above the year-earlier month. This large gain was due to the operation of the new 30 and 32-in. export line to Banias, Syria. The December production included 418,800 bbl. daily from Kirkuk field, 60,500 bbl. daily from Zubair, a new record high; and 24,000 bbl. daily from Ain Zalah in northern Iraq.

MIDDLE EAST

New Court Test

Italian tanker docks at port near Venice; Anglo-Iranian obtains court order impounding cargo of Iranian fuel oil

THE small Italian tanker Miriella docked February 14 at Porto Marghera near Venice, and her cargo of Iranian oil was immediately impounded on a court order obtained by Anglo-Iranian Oil Co., Ltd.

Thus commenced the second court test of the company's legal claims against oil from its nationalized properties in southern Iran. The first case, before a British court at Aden and involving the tanker Rose Mary, resulted in a decision turning the oil cargo over to the company.

The Miriella was still pumping its cargo into tanks at the port when attorneys for Anglo-Iranian applied for and obtained a 15-day "judicial sequestration" from an Italian court in Venice. The effect of an order of this nature is to tie up the cargo pending final decision on its disputed ownership.

Early decision . . . Italian customs officers sealed the dockside tanks into which the Miriella's cargo had been transferred. Attorneys for both Anglo-Iranian and the Italian company, Supor, which chartered the vessel, were preparing briefs and evidence to submit to the court for a promised decision by March 1.

If Anglo-Iranian's claim to the oil is turned down in Venice, the company can still go before another Italian court in Rome where the Supor company has its headquarters. Anglo-Iranian could seek repayment there for the value of the cargo and also damages against the exporting company.

The Miriella loaded January 19 at Abadan. The oil was supplied by National Iranian Oil Co., which controls the fields and refinery on behalf of the Iranian Government. The Supor company is one of a number of foreign firms which have contracted to buy oil from Iran since the nationalization.

The Miriella carried 4,635 tons of what is reported to be fuel oil. This would be about 31,000 bbl., a much larger cargo than the approximately 5,700 bbl. of crude taken out of Iran last June by the Rose Mary. After the court decision at Aden in January, the Rose Mary's oil was transferred to an Anglo-Iranian tanker which last week was scheduled to arrive at Laverton, Australia, where an Anglo-Iranian affiliate operates a refinery.

Agreement hopes dim . . . There is now little expectation that any overall settlement between Britain and Iran will result from the mediation efforts which were initiated last December by the United States. Apparently the State Department pressure for a settlement has disappeared now that the Republican Administration has taken office in Washington.

The discussions which were taking place between Loy W. Henderson, U. S. ambassador in Teheran, and Prime Minister Mossadegh are now at a standstill, with Henderson said to be still awaiting new instructions from Washington. The attempt to find a basis for settlement is reported to have reached dead-center on much the same compensation and marketing issues that defeated the earlier negotiations.

Although the settlement efforts seemed to have bogged down, Dr. Mossadegh has appointed a committee in Teheran to work up the counterclaims which Iran will assert against Anglo-Iranian in any arbitration of the compensation question.

FAR EAST

Chinese to Intercept Tanker

A final effort to halt a Finnish tanker from reaching Communist China with a load of Romanian aviation fuel is expected to be made by the Chinese Nationalist Navy.

The Nationalist Government was believed ready to try to intercept the tanker as it approaches the Chinese coast. The 7,717-ton vessel, the Wiima, became the object of international attention earlier this month. The United

Exploration in Trinidad

Now drilling for Apex (Trinidad) Oilfields, Ltd., near San Fernando, Trinidad, in a deep exploratory drilling program is this Ideal Type 130 Rig. The rig arrived in Trinidad last spring and spudded in its first well July 23, 1952. It has a depth range of about 10,000 to 16,000 ft.

States Government sought to have the Finnish Government stop the voyage and subsequently approached the Turkish Government on possible interception in the Dardanelles. Both governments said they were powerless to act.

The oil carried by the Wiima is reported to be a distillate fuel suitable for jet aircraft. In Helsinki, Finland, the owner of the tanker, said the cargo was exclusively oil for household use and had no strategic importance whatsoever.

Bengal Basin Rights Sought

Standard-Vacuum Oil Co. is negotiating with the governments of Pakistan and India for full exploration rights over a large area of the Bengal basin.

During the latter part of 1951, Stanvac had an aerial-magnetometer survey carried out over 73,000 sq. miles of the area by Fairchild Aerial Service, Inc. It was the first aerial magnetic survey to be conducted in Asia, and the company is reported to have located structural indications considered worthy of further investigation.

Reports from India that the company is planning to spend the equivalent of about $21,000,000 on exploratory work in the region during the next 5 years were described as premature.

EUROPE

Russian Oil Report

Increased output is goal of Red's self-criticism

COMMUNIST Russia's oil industry has again subjected itself to a round of self-criticism in an effort to bolster production in lagging areas and improve the quality and quantity of its equipment.

N. Baibakov, the Soviet Union's oil minister, said the oil plan as a whole is being fulfilled but that individual operations are falling behind. It is impossible, he said, to be reconciled to the fact that during recent years drilling in the Azerbaijan, Grozny Oblast, and Dagestan regions has been "impermissibly" lagging.

In a statement made in Moscow, the minister revealed other shortcomings in the industry. In the East, 15 oil fields did not reach their targets although the administration for production as a whole overfilled the plan.

Bits defective . . . A drillers' conference held by the ministry last November disclosed substantial defects in factories producing drilling bits, he said. Quality of bits must be greatly improved in order to remove this handicap to high-speed drilling.

"At the same time, it must be noted that there are still big shortcomings in the very organization of drilling, and this involves big losses of time in drilling," he said.

Achievements cited . . . Baibakov balanced his criticism with reports of important achievements in several fields of oil-industry activity. He indicated offshore drilling is being expanded in the Caspian Sea. An important well in an offshore location was recently brought in. The Caspian program has involved the construction of 15 miles of trestles and the selection of more than 40 individual locations for further drilling.

Refining . . . Improvements are being made in Russian refining, he said, and during the past year, new capacity for both primary refining and for cracking has been brought into operation.

The use of turbine drilling (a Russian method using down-hole power) has been greatly expanded. In 1951, the proportion of turbine drilling was less than 30 per cent. Last year, the proportion increased to 41 per cent, and in a number of areas—Tataria, Bashkira, and others—turbine drilling comprises 85 per cent of the total, he said.

Production . . . Russia is now believed to be producing slightly less than 1,000,000 bbl. daily of crude oil. It was earlier announced that the goal for 1952 called for a total production of 47,000,000 metric tons.

It has also been disclosed that the new Russian gas pipe line from the Estonian shale fields to Tallin, the Estonian capital, is nearing completion.

Heads Exploration Company

Jacques Charbonneaux (right) is shown in Tulsa during a visit with Gerald Westby, president, and other officials of Seismograph Service Co. Charbonneaux is manager of the newly formed Cie. Francaise de Prospection Sismique, a Seismograph Service subsidiary formed in Paris. The company was organized in France in order that it might operate in the French colonies of Africa.

Flooded Plants in Operation

Two of the European refineries damaged in the early February floods which struck southeastern England, Holland, and Belgium, were being returned to production last week.

All units of Shell's Bataafsche Petroleum Mij. refinery at Pernis near Rotterdam in the Netherlands resumed production February 15. Distillation units and part of the thermal cracking equipment were in operation about a week after the plant was flooded, and other units, including the catalytic cracker, were quickly being returned to service. A Shell official said it was not yet possible to estimate the amount of damage.

Schoonebeek field was reported back in full production by the middle of the month. This field in eastern Netherlands normally produces about 13,000 bbl. daily. Production was suspended when the refinery was closed.

Officials of Vacuum Oil Co., Ltd., reported damage to the new Coryton plant on the north bank of the Thames River in England was not as widespread as originally believed. Process equipment, which began turning out products for the first time less than a day before the flood hit was scheduled to be back in operation by the end of the month.

International Briefs

Another stepout well has been completed by Pantepec Oil Co., C.A., in the Guario dome sector of its El Roble concession in eastern Venezuela. Initial tests showed a flow of 800 bbl. daily of 44°-gravity crude from two zones, one at about 6,100 ft. and the other at 6,750 ft.

The coal-to-oil plant under construction in South Africa will be at the production stage by mid-1954, according to a recent statement by F. J. du Toit, chairman of the South African Coal, Oil & Gas Corp., Ltd. Most of the heavy machinery required for the operation is due to arrive the second half of this year. Engineers and skilled labor are being employed on the project from virtually every country in Western Europe and from the United States. The plant is being erected at Coalbrook, near Vereeniging in the Orange Free State.

Six SPHERICAL SEPARATORS

Each Handling

80 million CFPD

PEERLESS-SPECIALISTS in the SEPARATION of LIQUIDS and GASSES!

At a huge underground gas storage project in Pennsylvania, you'll find the SIX specially built PEERLESS SPHERICAL SEPARATORS, as pictured above. All compressed gas passes through these separators to prevent condensate from getting to the dehydration plant load and upsetting the schedule. These SIX PEERLESS SEPARATORS are good for 1,500 PSIG working pressure and are designed to pass 80 million CFPD each at 450 PSIG.

This is just another installation typical of the many applications of PEERLESS SEPARATION EQUIPMENT.

PEERLESS MFG. CO.

PEERLESS MANUFACTURING CO.

P. O. BOX 7193 ★ DALLAS, TEXAS ★ DIxon 8431

REPRESENTATIVES IN ALL PRINCIPAL CITIES

New Caltex Veep

H. H. Arnold, Jr., takes over production position

H. H. ARNOLD, JR., has joined California Texas Oil Co., Ltd., as a vice president in the company's producing division. He formerly was manager of foreign operations in the Eastern Hemisphere for The Texas Co. in New York.

Arnold, 46, was born in Clarion, Pa., where his father was a pioneer oil producer. He attended Colgate University and the School of Mines of the University of Pittsburgh, where he was graduated in petroleum geology and engineering in 1927.

For the next 11 years he did geological work for The Texas Co., principally in the Oklahoma division.

During World War II he served as a task-force engineer officer in the North African invasion and continued on throughout the Tunisian campaign with British, French and American forces.

He was coauthor of a U. S. Army field manual on land mines and mine warfare. He also was chief of the major departmental unit in the engineer school at Fort Belvoir. His decorations include the Legion of Merit, Silver Star, Croix-de-Guerre, and the Bronze Arrowhead.

He returned to The Texas Co. in 1946 and 2 years later became manager of the company's Rocky Mountain division. He later served as manager of exploration for McColl-Frontenac Oil Co. and Texaco Exploration Co. in Calgary before returning to New York.

Federico Baptista, assistant district superintendent for Creole Petroleum Corp. in La Salina, Maracaibo Lake area, in Venezuela, has been named district superintendent in Caripito in Eastern Venezuela. **Hugh Wynn** will replace Baptista in La Salina. **Domingo Casanova** has been transferred from Pedernales field to Jusepin as acting district superintendent. **J. L. Ford,** district superintendent in Tia Juana, has been transferred to Maracaibo as acting division assistant manager. **L. M. Eldridge** has been transferred from Quiriquire field, Eastern Venezuela, to Tia Juana to replace Ford. **L. A. Summers,** district superintendent in Jusepin, Eastern Venezuela, has been appointed district superintendent in Maracaibo.

William D. Baskett, Jr., has been named executive vice president of Frontier Oil Refining Co., Buffalo, N. Y. Since 1950 he has been assistant to the president of Allied Oil Co. and Frontier, both divisions of Ashland Oil & Refining Co. During World War II, he was executive secretary of several petroleum-industry committees of the Petroleum Administration for War in Chicago. **M. C. Sumpter,** who has been manager of refining for Frontier since 1937, has been named a vice president.

A. Ludlow Clayden has been appointed technical associate in the research and development department of

A. L. CLAYDEN

JOHN MOXEY, JR.

Sun Oil Co. at Philadelphia. Clayden, who has been a Sun engineer for 30 years, will serve as a staff assistant on problems dealing with automotive matters. He will be succeeded as manager of the company's automotive laboratory by **John Moxey, Jr.,** who has been his assistant.

Roger Henquet, formerly Eastern Hemisphere representative for Superior Oil Co. in charge of the firm's Paris headquarters, has opened petroleum-engineering offices in Paris, under the firm name, Societe d'Etudes Petrolieres. For many years he was general manager for Schlumberger Well Surveying Corp. in the United States.

Walter H. Rose has been transferred from Baton Rouge, La., to Fort Worth as regional geologist for Southern Production Co.

Wallace L. Hammer, formerly a junior petroleum engineer for Stanolind Oil & Gas Co. at Odessa, Tex., has been appointed a petroleum engineer for Abilene Sample Log Service at Abilene, Tex.

Jack E. Hiatt has been named production foreman for Sunray Oil Corp. in the Coalinga (Calif) area and will supervise activities in Guijarral Hills field. He succeeds **Clyde Allison,** who has been named production superintendent for the California district.

H. B. COX

H. Ben Cox has been appointed to the newly created position of manager of exploration for Cities Service Oil Co.'s southern division at Houston. Cox, who has been with the company nearly 30 years, will be succeeded as manager of the company's land department at Bartlesville, Okla., by **J. E. McColl,** assistant superintendent.

Leon G. Dufilho has been appointed manager of refineries for Eastern States Petroleum Co., Inc., in Houston. For the past 19 years he has been engaged in refinery operations for Premier Oil Co. in Longview, Tex.

Jack L. Barnett, formerly a laboratory technician for Sinclair Rubber, Inc., at Houston, has joined General Crude Oil Co. as a junior petroleum engineer in Salt Creek field, Kent County, Texas.

Dr. Gustav Egloff, director of research for Universal Oil Products Co., will receive the Washington Award for 1953 at a dinner in Chicago February 23. The award is given annually to an outstanding engineer for accomplishments promoting the "happiness, comfort, and well being of humanity." Selection of the engineer to be honored is made by a commission representing the American Society of Civil Engineers, the American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical En-

PERSONALS

gineers, and the Western Society of Engineers. **Ovid W. Esbach,** president of the Western Society and dean of the Technological Institute of Northwestern University, will make the presentation.

John W. Hancock has been elected president of Hancock Oil Co., Los Angeles, succeeding **Will J. Reid,** who has

J. W. HANCOCK

W. T. HANCOCK

been named chairman of the board. Other officers named include: **W. T. Hancock,** executive vice president; **J. J. Shrewsbury,** vice president and treasurer; and **B. H. Dresser,** secretary. **P. T. Martin, N. D. Taylor** and Dresser were elected directors.

Rolla E. Hargrove has resigned as district geologist for Hancock Oil Co. to open offices as a consultant at Midland, Tex. Before joining Hancock he was assistant district geologist for Seaboard Oil Co. for several years.

Scott P. Ewing, corrosion engineer for Carter Oil Co. at Tulsa, will receive the 1953 Speller Award in Chicago March 19. The presentation will be made at the annual banquet of the National Association of Corrosion Engineers. The award, named for F. N. Speller, is presented annually in recognition of achievement in the field of corrosive engineering.

E. F. Battson, administrative vice president of Continental Oil Co. at Houston, has been elected chairman of the executive committee of the company's board of directors. **Charles A. Perlitz,** Jr., vice president, and **Ira H. Cram,** vice president in charge of exploration, have been given newly created positions as senior vice presidents. Both Perlitz and Cram will continue to make their headquarters in Houston, but Battson will establish his office in New York by March 15. Battson succeeds **George Whitney,** who resigned as chairman of the executive committee but will continue to serve as a committee member. Battson will continue as a company vice president.

Jerry V. George, petroleum engineer for Magnolia Petroleum Co., has been transferred from Lake Charles, La., to Salem, Ill.

Leland E. Wilson, junior drilling engineer for Atlantic Refining Co., has been transferred from Magnolia, Ark., to Midland, Tex.

Reese H. Tucker has been elected a director of Cities Service Oil Co. (Del.). Tucker, who joined the company in 1920 as a junior engineer, is manager of the land and geological division.

William W. Wallace, Jr., has resigned as a production foreman for Atlantic Refining Co. at Odessa, Tex., to become production superintendent for the West Texas division of McElroy Ranch Co. of Midland, Tex.

Harlan H. Yoakam has joined the geological department of L. E. Scherck, independent operator, in San Angelo, Tex. He formerly was West Texas district geologist for Delta Gulf Drilling Co. in Midland, Tex.

W. V. Ischie, former superintendent of Sinclair Refining Co.'s East Chicago refinery, has completed a tour of duty as director of refining in the foreign division of the Petroleum Administration for Defense. He has been named assistant to the manager of refineries for Sinclair at New York.

John S. Wilson, Jr., has been appointed chief chemist for Hunt Oil Co. at Tuscaloosa, Ala. He formerly was a senior petroleum engineer for Creole Petroleum Corp. at Quiriquire in eastern Venezuela. Prior to going to Venezuela in 1948 he was employed by Lion Oil Co.

E. D. Powers has been elected president of Chemical Construction Corp. He also has been elected a director and member of the executive committee and will remain as vice president and director of the parent firm, American Cyanamid Co. **William N. Porter,** who has been president of Chemical Construction Corp., since 1947, has been elecetd chairman of the board of directors.

James W. Kerr has been appointed material superintendent for the engineering department of General Petroleum Corp., Los Angeles. He formerly was engineering coordinator for the engineering construction department at Vernon, Calif. **D. R. Noggle,** second engineer, has been promoted to plant superintendent for the pipe-line department at Vernon. **H. A. Nash,** shift foreman, has been promoted to shift superintendent in the refining department at Torrance, Calif.

Dalton Eash has been named a process engineer for Derby Oil Co. at Wichita. He formerly was a process engineer for The Texas Co. at Port Arthur, Tex.

W. T. Doherty, Houston, has been elected to the board of directors of the First National Bank there. He is president of Mound Co., vice president of Fidelity Oil & Royalty Co., and co-author of "Practical Petroleum Engineering," which is used as a college textbook.

W. E. Kennel has been promoted to section leader in the chemical products division research laboratories of Standard Oil Co. (Ind.) in Whiting, Ind. Dr. Kennel, who joined Standard in 1948 as a chemical engineer, was advanced to group leader last year. **V. J. O'Brien, Jr.,** and **K. C. Peterson** have been appointed group leaders in the same division.

Hartley C. Gleason has been appointed manager of production and drilling for the Crusader Corp., Denver. He replaces **John W. Denny,** Casper, Wyo., who died January 19. Gleason formerly was production engineer for British American Oil Co. in charge of the Rocky Mountain district. Prior to joining British American in 1947 he was with Magnolia Petroleum Co. and Stanolind Oil & Gas Co.

F. A. Davis, chief engineer in British-American Oil Co.'s manufacturing department, has been transferred from Toronto, Ont., as assistant manager of the company's Clarkson refinery, succeeding **F. E. Doyle,** retired. **W. J. Godsman** has been appointed chief engineer, to succeed Davis. **W. J. McGuire** has been promoted to operations control supervisor. **H. A. Hornfelt,** who was construction superintendent during the recent Moose Jaw refinery expansion, has returned to Toronto to head the mechanical engineering division of the manufacturing department. In the same department, metals inspection is now headed by **H. G. Bennett.** At Clarkson, **C. T. Taylor** is the new maintenance superintendent, and **D. G. Berry** is now operating superintendent.

PERSONALS

Herbert Schlundt, division geophysicist for Lion Oil Co., has been transferred to Bismarck, N. D.

E. N. Van Duzee, New Orleans area production-department manager for Shell Oil Co., has been assigned to the New York office. **J. W. Pittman,** formerly area production superintendent, will fill the vacancy left by Van Duzee's new assignment.

Jonathan D. Lankford has been appointed chief of Region V, of the fuels technology division of the Bureau of Mines at Minneapolis. He succeeds **Alex C. Burr,** who has resigned to return to the full-time directorship of the North Dakota Research Foundation in Bismarck. Dr. Burr will continue to serve the bureau as a consultant. Lankford formerly was stationed with the bureau at Rifle, Colo.

A. C. Gauthier, Jr., and **Walter W. Heard, Jr.,** have organized Gauthier & Heard, a petroleum-engineering-consulting firm in Natchez, Miss. They will specialize in evaluations, well completions, production problems, and core analysis. Heard formerly was with The California Co. for 5 years as a development, production, and reservoir engineer. Gauthier was divisional engineer for Hart & Kelley Laboratories for 4 years.

Willard L. Roy, production engineer for Sunray Oil Corp., has been transferred from Barnsdall, Okla., to Odessa, Tex.

Dr. Elburt F. Osborn, associate dean of the School of Mineral Industries at Pennsylvania State College, has been named dean of the school, effective July 1. He will succeed **Dr. Edward Steidle,** who will retire with emeritus rank June 30.

James D. Hillhouse, for the past 4 years a petroleum engineer for Humble Oil & Refining Co., has been appointed a reservoir engineer for Texas Gas Corp. and New Ulm Corp., Houston.

DEATHS

E. J. Coyle, attorney and oil operator, died February 13 at his home in Springfield, Ill. Coyle served for several years as Illinois representative to the Interstate Oil Compact Commission. He also served as a member of the legal committee of the Independent Petroleum Association of America and was elected a director in 1949.

A. J. Swenson, 89, who held vast oil and ranching interests in West Texas, died February 14 at Stamford, Tex.

Dr. Luis H. Bartlett, 58, head of the chemical-engineering department of Oklahoma A. & M. College, Stillwater, died at Stillwater, February 16.

Earl Swaim Edwards, 70, who retired in 1947 as purchasing agent for Continental Oil Co., died recently at his home in Los Angeles.

Robert F. Duffield, 44, Midland, Tex., independent operator, was killed in an automobile accident near Pierre, S. D., February 12.

Nile Bailey Copeland, 45, independent oil operator, died following a heart attack at his home in Naborton, La., February 11.

Lawrence J. Scheid, 34, plant manager, treasurer, and director of Osceola Refining Co., Reed City, Mich., died February 9 in Memphis.

Oliver W. Inman, who formerly was associated with his son and Robert H. Henderson in the old Basin Oil Co., died February 9 of a heart attack aboard a train en route to his home in Barbara Island, Calif.

J. D. Trimble, 62, El Dorado, Ark., independent producer, died recently of a heart attack in Jackson, Miss. Since 1923 he had been a partner in the producing firm of Bailey & Trimble. He formerly was vice president of the Independent Petroleum Association of America for Arkansas and served a 3-year term as a member of the I.P.A.A. executive committee.

James R. McLaughlin, 81, who retired in 1939 as superintendent for Ohio Pipe Line Co. at Ranger, Tex., died there February 17.

Robert Lloyd Anderson, 64, drilling contractor, died February 9 near Warren, Pa.

Jack H. Donavan, district geologist in Montana for Amerada Petroleum Corp., died February 9 in a Salt Lake City hospital.

George L. Andrews, 54, petroleum engineer for Standard Oil Co. of California, died February 10 at his home in Corona Del Mar, Calif.

W. A. (Cherry) Smith, 55, district foreman for Mid-Continent Pipe Line Co., died February 12 at his home in Drumright, Okla. He had been located in Drumright the past 15 years.

George C. Riggs, 54, cable-tool driller for McClure Drilling Co., died February 5 in a Hart, Mich., hospital.

William C. Guiler, 88, who helped develop several oil fields in Oklahoma, including those at Wann and Haskell, died of a heart attack February 17 at his home in Tulsa. He also engaged in the oil business in Ohio, Pennsylvania, Texas, and Canada until his retirement about 15 years ago.

William H. Correa, 66, former assistant to the president of Socony-Vacuum Oil Co., Inc., died February 15 in Cleveland. He also was a director of the old Standard Oil Co. of New York and general manager of Socony-Vacuum's lubrication department. He became assistant to the president in 1945.

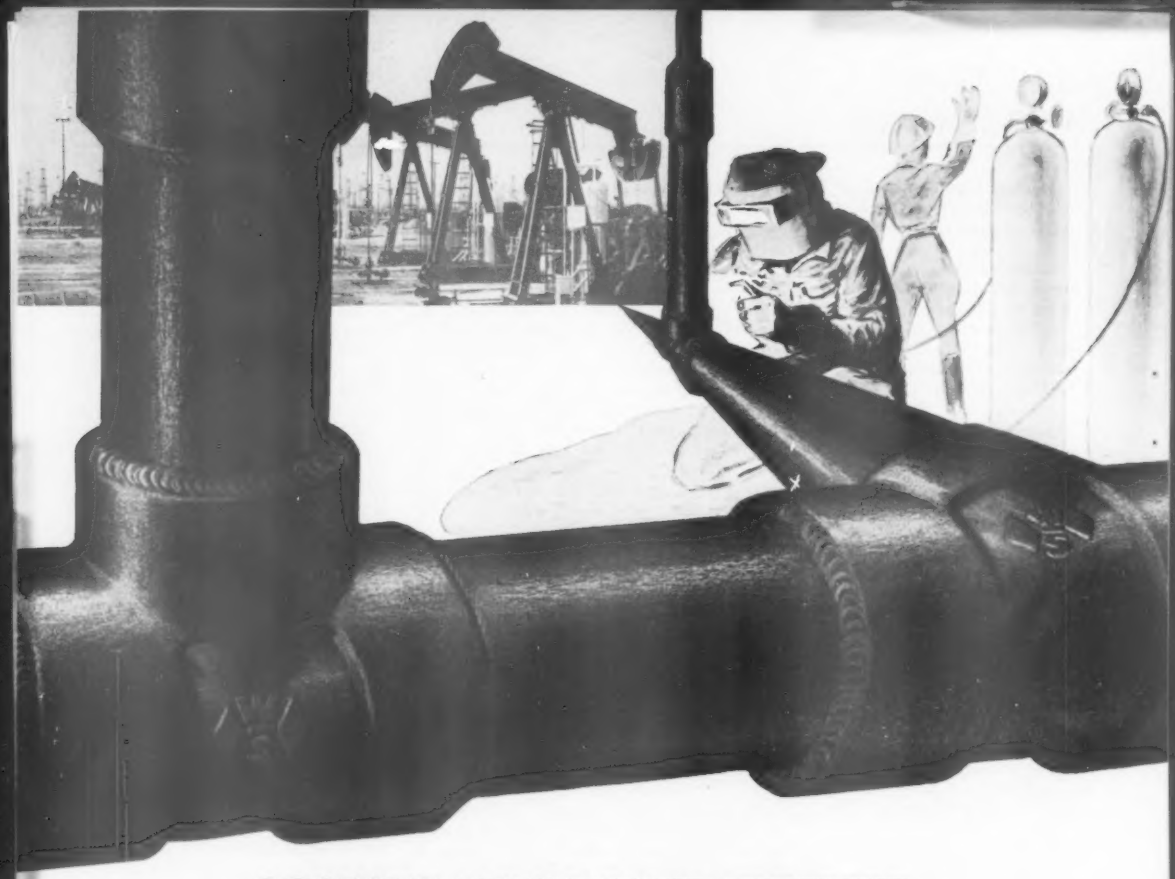
William J. Judge, retired president of National Fuel Gas Co., died February 14 in Upper Montclair, N. J. He formerly was assistant general auditor of the old Standard Oil Co., and later was a vice president, director, and president of National Gas Trust, the predecessor of National Fuel Gas Co.

Frank H. Gordon, 74, retired vice president of Lukens Steel Co., died February 10 at Coatesville, Pa.

Gerald F. Wilcox, 52, Mount Pleasant, Mich., independent lease and royalty dealer, was killed February 12 in an automobile accident.

Melvin H. Kuhl, 52, assistant general manager of the industrial division of Timken Roller Bearing Co., since 1945, died recently in Canton, Ohio.

Robert Ralston Rakestraw, 79, vice president of Western Oil & Refining Co., died February 11 in Los Angeles.



LOOKING DOWN YOUR PIPELINE..

. . . what do you see? Dependability . . . or frequent failure; long, economical life . . . or costly maintenance; W-S FORGED STEEL FITTINGS . . . or the ordinary kind that are a source of constant trouble and expense?

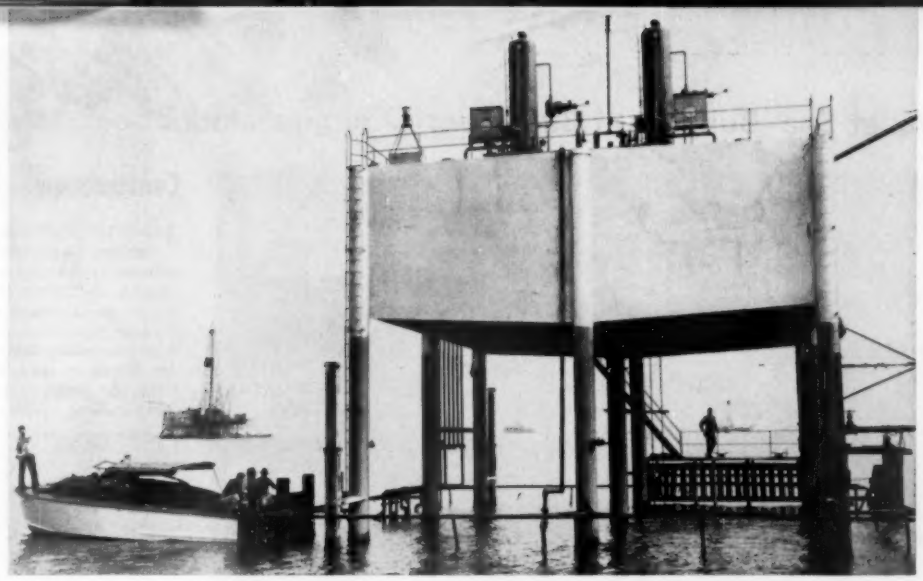
W-S Screw-end and socket-weld fittings are the *only* type that become integral parts of your steel pipe-lines . . . their forged steel construction matches that of the pipe or tubing in chemical and physical properties, in strength, weight and resistance to pressure . . . heat . . . corrosion.

Whatever your pipe or tubing application, you can profit from the permanence of W-S Fittings. Initial cost is often *less;* final cost is always *least.* Literature is available . . . write for it.

WATSON-STILLMAN FITTINGS DIVISION

H. K. PORTER COMPANY, INC.

126 ALDENE RD., ROSELLE, NEW JERSEY



TANK PUTS OUT TO SEA

Portable Submersible Tank-Battery Barge Withstands Weather's Sunday Punch

Storms, wind, and waves are shrugged off by this sea-going tank. The unit is easily transported to location, economical to salvage, and may be floated from one location to another.

by G. E. McClatchey*

A NEW type portable tank battery known as a submersible tank-battery barge is gaining favor with oil men who operate in shallow bays along the Texas and Louisiana Gulf Coast. The submersible tank-battery barge is a radical departure from tank batteries as they are known on shore, but the purpose of both is the same—to store oil.

The need for a portable tank battery that would withstand the ravages of storms, winds, and waves, became evident soon after oil production began to reach out in the semiopen water of the coastal bays. In the early developmental stages of new fields, it is often impossible to determine the best site for a tank battery to satisfy future requirements. Conventional tank batteries erected on piling platforms are quite expensive to build, and are extremely costly to move. A bad guess in selecting an offshore site for a permanent tank battery can be extremely costly.

*Assistant district superintendent, exploitation department, Sunray Oil Corp., Corpus Christi district.

When an operator does not elect to erect a permanent tank battery until the field is well defined, it is possible to flow direct into floating oil barges. This plan is not usually economical, however, and is more hazardous than flowing into permanent storage. The operating cost and rental of the necessary oil barges and tenders for producing into floating barges may even exceed the value of the oil produced.

A submersible tank-battery barge, although designed for use as permanent storage, may be moved for a very small fraction of the cost of moving a piling platform. The initial cost of a submersible tank battery, per barrel of storage, is roughly the same as a conventional tank battery erected on a steel-and-concrete piling platform.

The submersible tank-battery barges in use vary slightly as to size and auxiliary equipment, depending upon the individual requirements, but the fundamental design of all is the same. The ones illustrated here provide 5,000 bbl. oil storage each. They recently were installed in Corpus Christi Bay by Sunray Oil Corp.

Construction Details

The oil-storage space is a tank 48 ft. square and 12 ft. deep, divided in four compartments, each of which holds 1,250 bbl. This tank is supported by nine steel-pipe columns 20 in. in diameter, which elevate the bottom of the tank 21 ft. above the deck of a 60 by 48 by 5-ft. barge. The barge is also divided in four equal compartments. The top of the storage tank is a flat deck, which provides space for mounting oil and gas separators, well manifolds, and other necessary equipment.

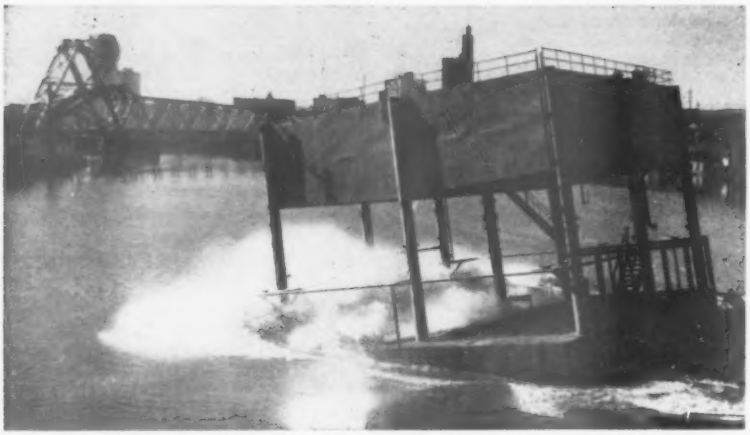
The Sunray barges were built by the shipbuilding division of Bethlehem Steel Co. in the Bethlehem shipyard at Beaumont, Tex. The barge is constructed on launching ways in the same manner as any other barge. The oil-storage tank is built simultaneously elsewhere in the

(Description continued on page 169; see next four pages for pictorial sequence.)

Tank at Sea—Building at Beaumont

Construction

1 Sunray crude-oil tank-battery barges are constructed by the shipbuilding division of Bethlehem Steel Co. in the Beaumont shipyard. In this view the barge is in the background near the center of the picture. Here the barge is nearly completed.



Launching

2 The barge is constructed on launching ways (as shown in 1) in the same manner as any other barge. Launching procedures are similar to those used for other vessels. In this view the barge has just reached the water. A few seconds later the lower deck was completely under water.

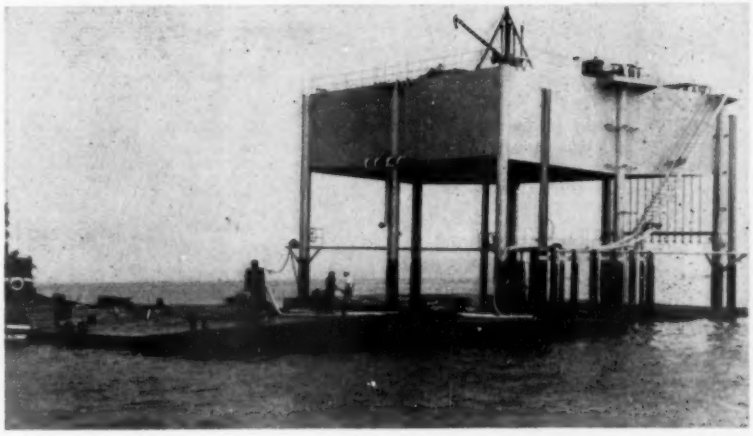
Towing

3 Oil-storage tank and equipment on the upper deck are built elsewhere in the yard and are installed after launching. Movement of launched barge in the shipyard and out is accomplished by tug. Here the barge moves down Neches River, on the way to Corpus Christi Bay.

Tank at Sea—Submersing in Corpus Bay

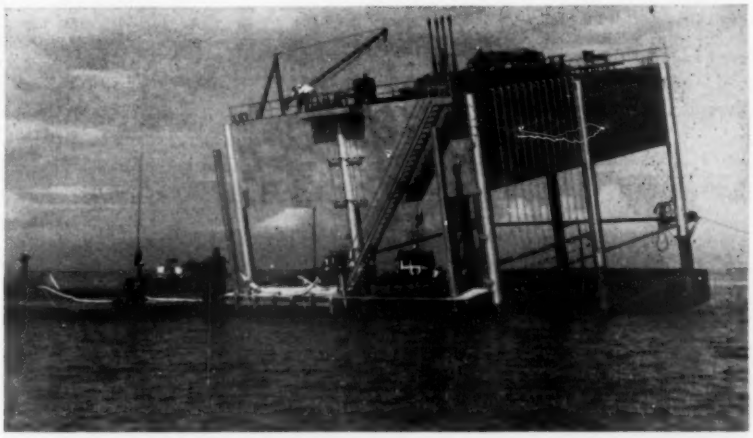
On Location

4 After the 250-mile water trip from Beaumont, the barge is now on location in Corpus Christi Bay, and submerging operations have been started. It is essential that one end of the barge be lowered first, since the vessel is unstable with deck submerged unless bottom contact is made.



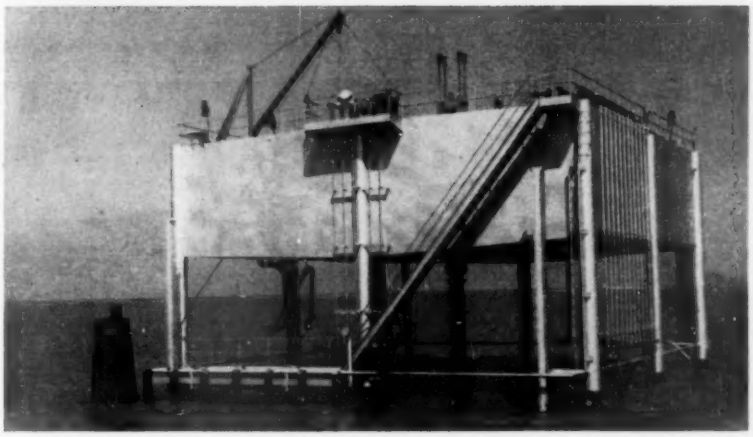
Going Down

5 The barge is submerged by pumping fresh water into the hull. Water is supplied on location by service barges. Here one end of the barge is on bottom. Flooding operations are restricted to one end of the barge until the compartments on that end are full.



On Bottom

6 Flooding is started on the end of the barge still afloat after the other end has touched bottom. Here the submersible tank-battery barge is shown sitting firmly on the bottom of the bay. The 12 lines on side of barge will be connected to well flow lines.



Tank at Sea—Pipe-Line Connections . . .

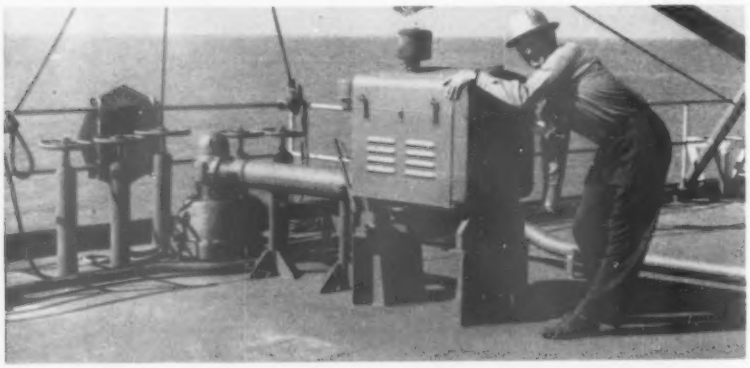
On Shore

7 Flow lines from the wells to the barge and from the barge to the shore are coated and wrapped to prevent corrosion. Most of the sections are welded together on shore. Pipe sections shown here have been completed and are assembled for moving into the bay.

At Sea

8 Pipe sections are pulled into the water, and empty oil drums are tied to the pipe to float it. Here 2,000 ft. of line is being towed to the barge from the shore 5 miles away. Two boats in tandem pull one end of flow line into position at tank battery.

Pumping Equipment



Safety

9 Special precautions are taken to insure safe operations aboard the submerged tank-battery barge. Here Sunray's John Goodman prepares to crank the engine that drives the flood pump. This pump is used to flood the tanks with sea water in event of an impending hurricane.

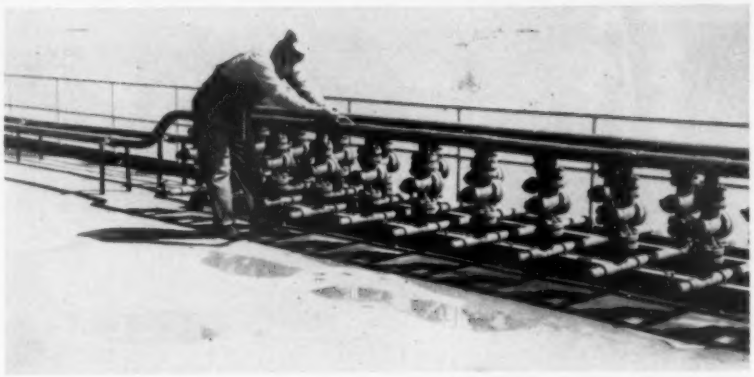
Circulation

10 Several pieces of versatile operating equipment are provided for operations on the barge. Here Switcher G. W. Hartsfield inspects the pump used to pump off tank bottoms, circulate oil in the tanks, or to transfer oil from one tank to another.

Tank at Sea—Gathering Operations . . .

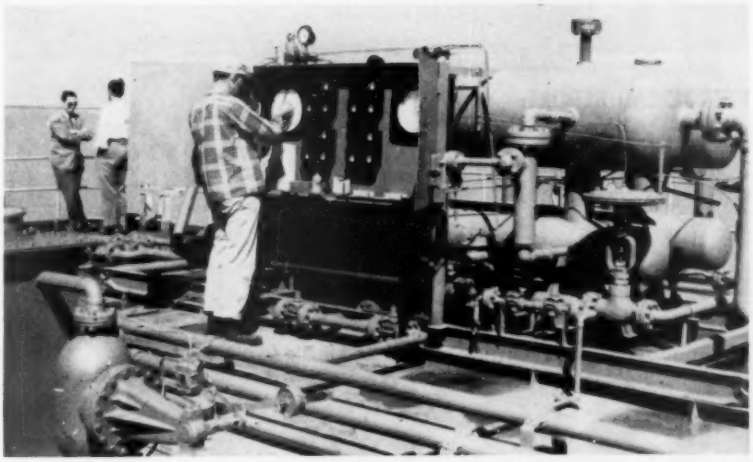
From the Wells

11 Oil from 12 Sunray wells is brought into the barge for gas separation and storage. The flow lines from the wells are brought up the side of the barge and into the manifold pictured here. Switcher McDonald is here shifting from one well to another.



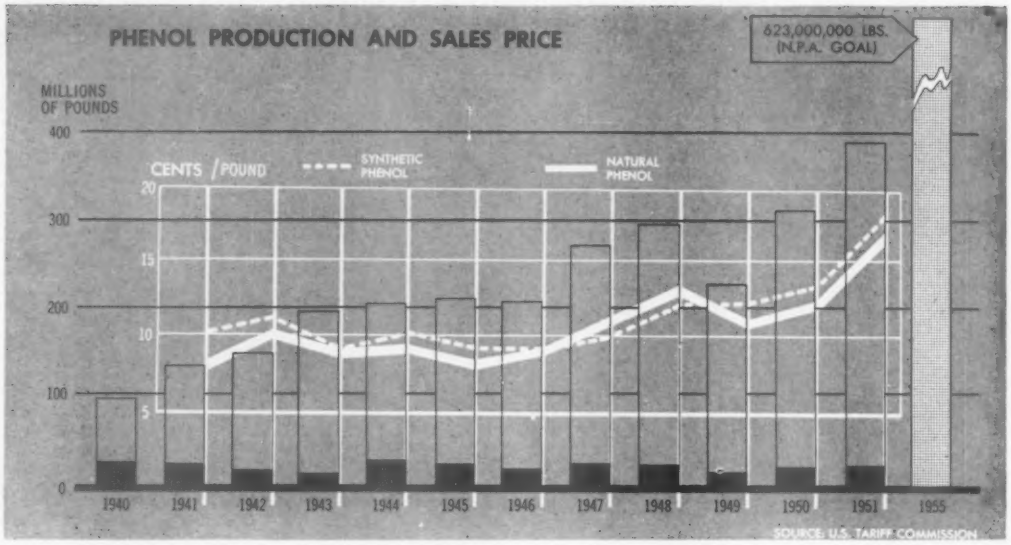
Oil-Gas Separation

12 The duties of the switchers stationed aboard the barge are diversified. Here Switcher Hartsfield changes chart on a gas meter. Other duties of the switchers include supervision of operation of automatic equipment and gaging tanks.



Oil to Storage

13 Switcher Gordon Hillhouse here inspects the control device for automatically shutting in all wells on the lease when the oil-storage space becomes full. At left in the picture is the four-compartment oil-storage tank in use on the barge.

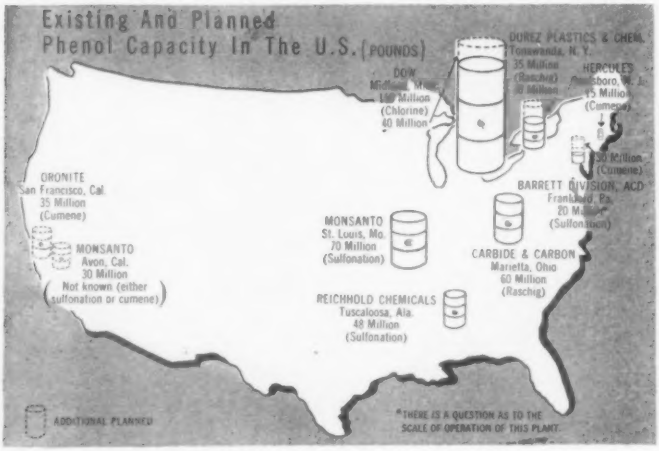


PETROCHEM REPORT:

HOW TO MAKE PHENOL

Four processes are available to make this valuable basic aromatic chemical: chlorine, sulfonation, raschig, and cumene. Present capacity is approximately 400 million pounds yearly; will expand nearly 50 per cent by 1954.

by John M. Weiss*


Existing And Planned Phenol Capacity In The U.S. (POUNDS)
DUREZ PLASTICS & CHEM. Tonawanda, N. Y. 35 Million (Raschig) 30 Million
HERCULES Hopewell, Va. 45 Million (Cumene)
DOW Midland, Mich. 150 Million (Chlorine) 40 Million
50 Million (Cumene)
BARRETT DIVISION, ACD Frankford, Pa. 20 Million (Sulfonation)
ORONITE San Francisco, Cal. 35 Million (Cumene)
MONSANTO Avon, Cal. 30 Million Not known (either sulfonation or cumene)
MONSANTO St. Louis, Mo. 70 Million (Sulfonation)
CARBIDE & CARBON Marietta, Ohio 60 Million (Raschig)
REICHHOLD CHEMICALS Tuscaloosa, Ala. 48 Million (Sulfonation)
ADDITIONAL PLANNED
*THERE IS A QUESTION AS TO THE SCALE OF OPERATION OF THIS PLANT

OF the aromatic chemicals produced by the United States chemical industry, phenol is one of the big three, somewhat larger than phthalic anhydride and smaller than styrene. A small part of the phenol is "natural phenol" naturally occurring in coal-tar distillates along with cresols and higher phenols, but the large proportion is produced synthetically from benzene.

Natural phenol has not varied very much over the period and is not likely to increase substantially in the future. Natural phenol estimates may be rounded off as around 25 million to 30 million pounds per year, or not very much more than in 1940.

Synthetic phenol, however, has increased about sixfold in 1951 as compared with 1940. Whereas in 1940, natural phenol was about 25 per cent of the production, the 1951 figure is only about 6 per cent of the total.

NPA Goals in Sight

If all plans are carried through, and allowing for 25 million pounds natural phenol, we will have a total capacity of 588 million pounds by the end of 1953 or 1954 if none of the present capacity is abandoned, as may happen in some of the older plants. This is approaching the goal of 623 million pounds set by the National Production Authority in Washington as the desideratum for 1955.

This leaves the prospective capacity for the country divided among the

*John M. Weiss & Co., New York. Reprinted from Chemical and Engineering News, November 10, 1952, (by permission of copyright owner, American Chemical Society). Also printed in Heat Engineering, November 1952.

for in or out bulk liquid storage

In 5 great markets General American offers you complete bulk liquid storage terminal facilities with no capital investment on your part.

You use modern facilities, pipelines, manifolds, blending equipment.

You have complete privacy.

All methods of bulk liquid transportation available.

At the Ports of New York and New Orleans there is high-speed canning, drumming and barrelling equipment—yours to use.

use General American's "for lease" facilities at Houston

Houston is recognized as the petro-chemical marketing center in Texas. Via tanker alone it handles 484.9 million lb. of bulk liquids every month.

for dependability, see GENERAL AMERICAN

5 TANK STORAGE TERMINALS

in Important Marketing Centers

- Port of New York (Carteret, N. J.)
- Port of New Orleans (Goodhope, La.)
- Chicago
- Houston
- Corpus Christi

GENERAL AMERICAN TANK STORAGE TERMINALS

a division of General American Transportation Corporation
135 South La Salle Street, Chicago 90, Illinois

Discovers Goldmine in Oilfields

ON ROAD TO PROFIT: TD-14A pushes road to Humble Oil Company well in Talco Field.

Rugged, Reliable Internationals Prove Real Money-Makers for Texas Contractor

John D. Wright, oil field contractor, Talco, Texas, bought his first International in 1941. Since then he has used nothing else for oil field preparation.

There is one big reason why: he *makes more money*.

Here's the way he puts it:

"I had one TD-14 I used for over five years. This crawler gave me better service and made me more money than you could ever expect from any tractor its size.

"I've never seen a tractor that could out work my Internationals. I now have three TD-24s for land clearing and heavy dirt jobs and a TD-14A for special oil field work.

You can get this kind of bonus performance, and make it mean more profit for you. Get the complete story from your International Industrial Distributor.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

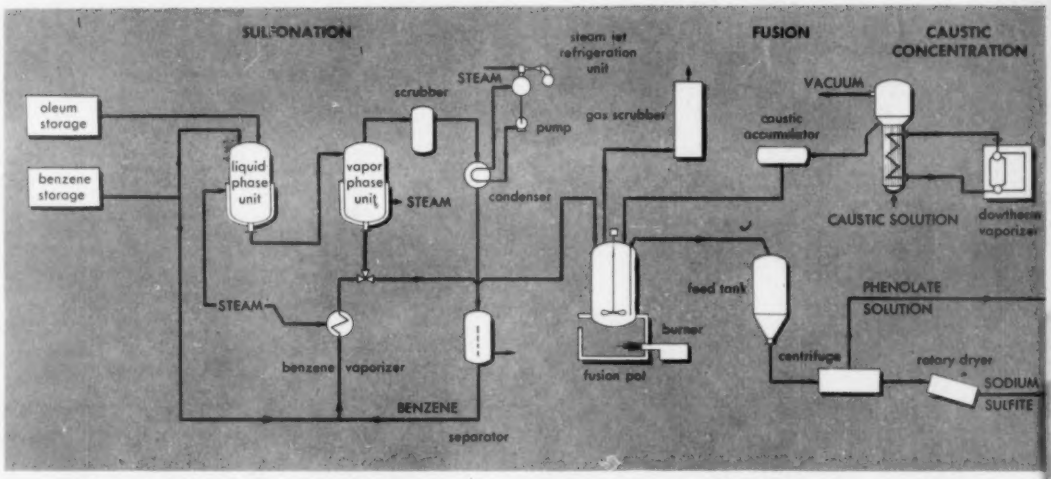
RECORD DURABILITY and top performance keeps contractor J. D. Wright sold on Internationals. Here he is beside his newest addition, a rugged TD-24—the most powerful crawler on the market.

IT'S INTERNATIONAL all the way with Mr. Wright. Here one of his TD-24s is moved to new job location on trailer pulled by IH L-190 series truck tractor.

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS



INITIAL PROCESSING in sulfonation method for producing phenol is shown here. **FINAL STEPS** are shown on page 152.

four types of processes as shown in the table below.

PROSPECTIVE CAPACITY
(Million pounds)

Chlorine	190
Sulfonation	138
Raschig	125
Cumene	80
Unknown (either sulfonation or cumene)	30
Total	563

It is rather unusual in chemical industry to have four such differing processes operating on a very large scale side by side and it is a matter of interesting speculation as to the economics of the situation. All four processes require benzene in about the same proportion, which means 4½ to 6 cents per pound of phenol (depending on the cost of benzene at various locations) and will have fixed charges of 1 to 2 cents per pound.

With selling prices of phenol at about 19 cents per pound, the general margin for other chemical and manufacturing costs is not large, and variations in cost between the various processes are not great enough to obviate competition between properly located plants.

Cumene process . . . The cumene process is relatively new in industry although the reactions are old. It has not, as far as the writer is aware, been operated on other than a pilot-plant scale. It has the especial interest that it requires neither chlorine nor sulfuric acid, both of which inorganic chemicals have at times been in very short supply.

The economics of the process, assuming about the same benzene use as the older processes, have as an important factor the cost of propylene and the sales value of the byproduct acetone. Theoretically, 1 part of phenol requires 0.446 part of propylene and 0.617 part of acetone will be produced as byproduct. As a matter of fact, somewhat more propylene will be required and less acetone produced since the yields are certainly substantially less than theory.

Cheap propylene is essential, which means proximity to an oil refinery or other oil-cracking operation where the propylene is available as a byproduct. The acetone credit may vary widely. At present prices, it could amount to 5 cents gross per pound of phenol but prices of earlier years could cut this credit in half. It is not too much to expect that the credit will balance the cost of propylene used.

From the standpoint of chemical use and credit for byproducts, the cumene process is a very attractive one. The cumene peroxide reaction is incomplete, however, and requires a considerable recycle to obtain good over-all yields. The process appears to be best adapted to large-scale production with continuous operation, but the real possibilities of the process cannot be finally appraised until plants are in operation for some time.

The chlorine process, operated only by Dow Chemical Co., has, as a most important item, the cost of chlorine or the cost of electric power to produce chlorine. It could not be operated to advantage on the basis of purchased liquid chlorine and hence any plant operated by this method must involve byproduct chlorine (as from a magnesium operation) or the installation of electrolytic cells, thereby eliminating compression and transportation costs.

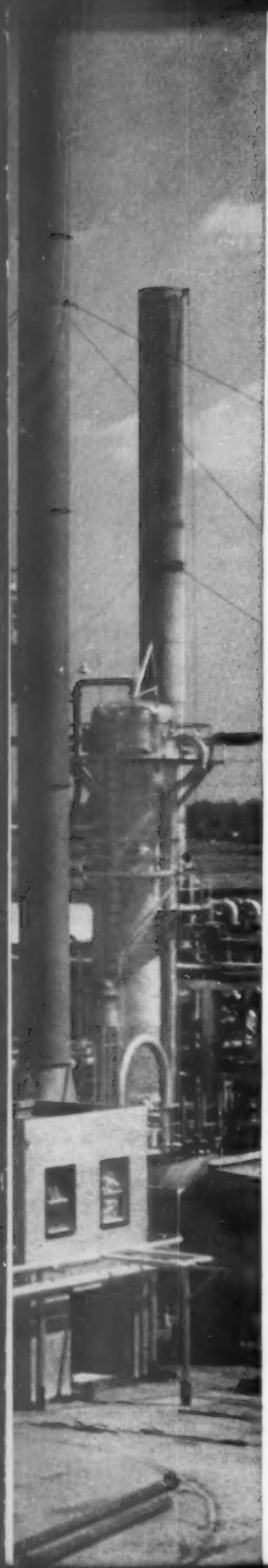
A moderate amount of byproducts is produced, chiefly di and trichlor benzene, diphenyl oxide, and hydroxy diphenyls, and the credit for these will usually approximate 1 cent or more per pound of phenol. We are informed that a large-scale operation, of the order of 30 million pounds or more phenol per year, is required for an economic enterprise. On small-scale operation, the relation of plant cost to output is too great.

Raschig process . . . The Raschig process operated by Durez Plastics & Chemical Co. and Carbide & Carbon Chemicals Co. has theoretically no chemical cost other than benzene but actually, of course, requires makeup hydrochloric acid and catalyst. A low material cost is counterbalanced in part by a high use of steam and cooling water. This is because the reactions are very incomplete (said to be about 10 to 15 per cent per cycle) so that a major amount of separation and recycle is required in both stages.

The presence of wet hydrochloric acid involves difficult corrosion problems and hence the plant cost and depreciation are high. Only large single continuous units are economically possible. The process has the advantage that there are no geographical limits in which it can operate economically.

Sulfonation process . . . The sulfonation process as operated in the United States starts with benzene and sulfuric acid (oleum) and by a vapor phase sulfonation with passage of benzene vapor, the sulfuric acid is almost completely utilized so as to give a high purity benzene sulfonic acid. This differs from the older classical sulfonation processes where a considerable excess of sulfuric acid remained unutilized and was re-

DID YOU KNOW THAT
UNIVERSAL SERVICE PROTECTS
YOUR INVESTMENT 7 WAYS?



UNIVERSAL FIELD SERVICE PROTECTS YOUR INVESTMENT

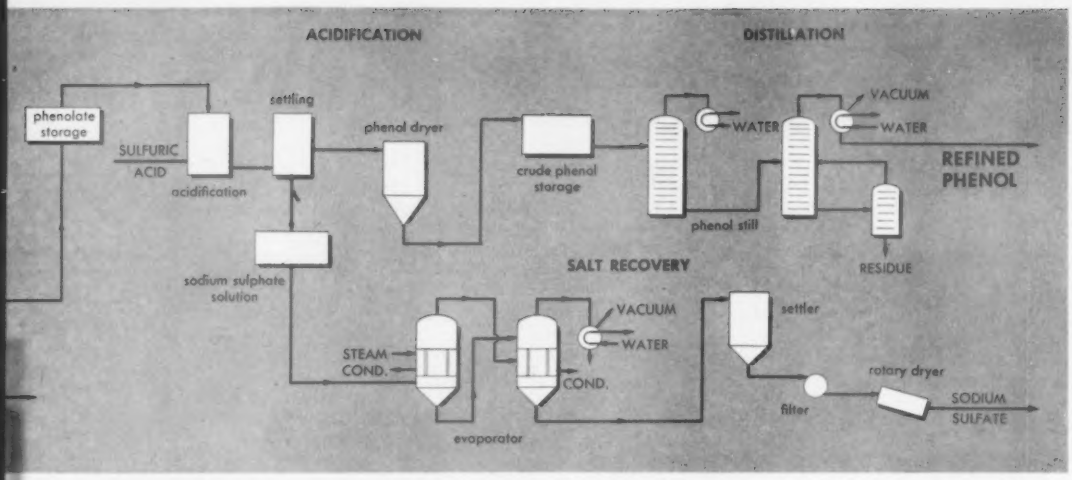
Always available on request . . . UOP refinery engineers and inspectors provide licensees with valuable post on-stream assistance. This service is completely flexible—whatever may be required to meet the immediate or long-term needs of the refiner, regardless of the size or extent of his operations.

By utilizing the knowledge and experience of men who are constantly working with refineries throughout the world, the UOP licensee has every advantage in maintaining his plant at peak operating condition. This phase of UOP field service with its assurance of maximum safety, efficiency, and profitability is another way in which Universal Service Protects Your Investment.

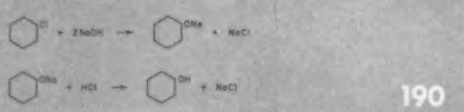
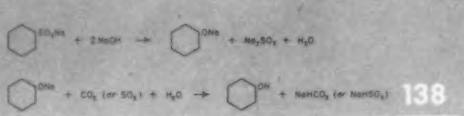
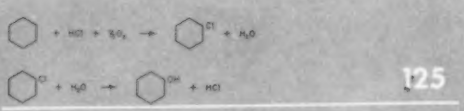
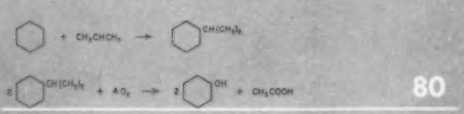
UNIVERSAL OIL PRODUCTS COMPANY

General Offices: 30 ALGONQUIN ROAD, DES PLAINES, ILL., U.S.A.
Laboratories: RIVERSIDE, ILLINOIS

Universal Service Protects Your Investment through laboratory research . . . pilot plant studies . . . design and engineering . . . construction supervision . . . licensee instruction . . . post on-stream service . . . collateral services.



FINAL PROCESSING in sulfonation method for producing phenol is shown here. **INITIAL STEPS** are shown on page 149.

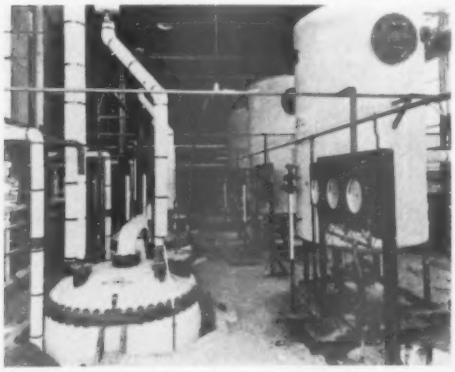
POTENTIAL PHENOL CAPACITY	MILLIONS OF POUNDS
CHLORINE	
	190
SULFONATION	
	138
RASCHIG	
	125
CUMENE	
	80
UNKNOWN (Sulfonation or Cumene)	
?	30
TOTAL	563

Sulfonation process ... The fundamental problem in the synthetic manufacture of phenol is the transformation of a molecule of benzene to one of phenol. This change can be effected only after a series of carefully controlled chemical reactions. The basic chemical steps required to bring about this change in the sulfonation process are shown in this simplified flow sheet. In the first step (sulfonation) sulfuric acid is used to replace one of the hydrogen atoms in the benzene ring by a sulfonic acid radical, the benzene being converted to sulfonic acid. Water is a resulting byproduct.

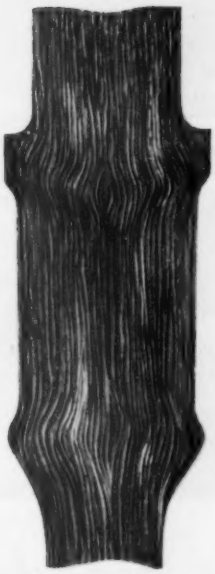
In the next step (fusion) the benzene sulfonic acid, which is more active chemically than the original benzene, is heated with fused sodium hydroxide. The resulting compound is sodium phenate. In this instance, sodium sulfite as well as water are formed as byproducts.

Sodium phenate can be easily converted into phenol by reaction with sulfuric acid, forming sodium sulfate as a byproduct. This step is acidification.

The chemical changes now complete, the phenol is purified by fractional distillation to remove water and recover a pure, colorless product. This final step is carried out in the distillation section.



SULFONATION EQUIPMENT.—Installation shown in this photograph is at the Reichhold Chemicals, Inc., plant at Tuscaloosa, Ala. At left are the vapor-phase sulfonators. At right are the caustic scrubber tanks and automatic controls.



Axelson rods are more than just threaded bar stock. Every step in the manufacture is the result of years of tests and checks. This picture shows the uniform grain flow lines resulting from heat treating the entire rod after forging to restore maximum strength.

INCREASE b/d

MAXIMUM FLOW AT LOWEST COST PER BARREL

Trying to increase Barrels per Day by the trial and error method of rod string selection is a sure fire way of tossing money down the hole — and it is a needless waste. Axelson, with its more than 60 years of experience in the field, has experts throughout the petroleum world fully qualified to make correct recommendations.

The proper selection of the type of rod, the correct size or combination of sizes are of the first importance when considering a new rod string. Your Axelson expert in pumping will be glad to study this or any other production problem with you. He can help you increase b/d at lower cost.

Chosen first....to last **AXELSON**

PETROLEUM PUMPING EQUIPMENT

PSC — THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON MANUFACTURING COMPANY • Division of Pressed Steel Car Company, Inc. • PLANTS: Los Angeles 58, California • St. Louis 16, Missouri. • OFFICES: New York 7, New York Tulsa 1, Oklahoma • Buenos Aires, Argentina. DISTRIBUTORS: Jones & Laughlin Supply Co.; Great Northern Tool & Supply Co.; Industrial Agencies, Ltd., San Fernando, Trinidad, B. W. I.; Industrias Waldrip & Campbell, Barcelona, Caracas and Maracaibo, Venezuela; South American Supply Co., Ltd., Lima, Peru; Sociedad Comercial de Materias Primas Limitado, Rio de Janeiro, Brazil; G. Saavedra e Hijos, S. de R. L. Avenida Morelos 31, Mexico, D. F.; Dominion Oil Field Supply Co., Ltd.; Calgary, Canada.

FR-18

moved as calcium sulfate by treatment with lime.

After the sulfonation, the process proceeds in two ways. In one, the sulfonic acid is run directly into molten caustic soda in a fusion pot to accomplish in one operation the formation of the sodium salt and its hydrolysis. The heat of neutralization is utilized, thereby materially reducing fuel requirements.

Subsequent treatment recovers the caustic soda in the form of sodium sulfate and sodium sulfite, both of which can be sold as salt cake to kraft-paper plants. This credit is vital to economic operation and hence a plant, to be successful, must be located not too far from a source of caustic soda and sulfuric acid and close to an outlet for salt cake.

Freight rates on salt cake (from natural sources) are often in excess of 10 dollars per ton, so that a phenol plant near a paper mill can achieve a very satisfactory credit. This is necessary since this variation of the process uses high amounts of acid and caustic and without byproduct credit would be quite uneconomic.

Another variation in use is the neutralization of the sulfonic acid with a part of the sodium sulfite obtained from the process and the use of the SO_2 evolved for later acidification of the sodium phenolate. This reduces by about one-third the use of caustic soda and sulfuric acid as compared with the acid fusion and recovers only an impure sodium sulfite as a byproduct. The fusion operation is a salt fusion and requires more heat than the acid fusion first described.

The economics of this method reside in great part in the sale of sodium sulfite for boiler treatment or its further use to produce pure chemicals such as sodium bisulfite or sodium hyposulfite. The operation is preferably connected with the manufacture of sulfuric acid and other inorganic chemicals and this imposes a certain geographical limit on the operation.

Investment Costs Lower for Sulfonation

Either variation of the sulfonation process has one advantage—in comparison to the other processes described, each can be operated on a relatively small scale. Investment costs for a sulfonation plant are much lower on small plants than the other processes so that in many foreign countries the sulfonation process is the most economic when capital costs are considered, especially when the phenol is used by the maker and merely has to compete with purchased material.

In spite of the development of all the other processes, the sulfonation process is by no means outmoded and, in

Two for the Money!

TWO PAYS - TWO PUMPS - ONE WELL BORE

OTIS TWO-ZONE PUMP

6 Operating Advantages—

- Both zones pumped simultaneously
- Flexibility—pump one and flow one
- Fluids do not commingle
- No complex sub-surface equipment
- No extra well head fittings
- Complete assembly installed with regular well service rig

OTIS

OTIS PRESSURE CONTROL, Inc.

Dallas . Houston . Corpus Christi . Victoria . Longview . Falfurrias . Odessa
New Iberia . Shreveport . Houma . Brookhaven . Oklahoma City . Elk City
Canadian Dealer—Otis Pressure Control Export, Inc., 8035 102nd St., Edmonton

certain situations, will be best fitted for the needs. Sulfuric acid and caustic soda may become more readily available and drop in price. This must be considered as a possibility, especially where a moderate-scale operation is contemplated. In such cases, the capital cost of the several processes is a vital item.

There are certain recent developments which may further improve the sulfonation process which are described in a U. S. patent 2,407,044 issued to Daniel Tyrer on September 3, 1946.

The patent is designed to obviate substantial chemical use in the fusion operation. A base mixture of potassium chloride, sodium benzene sulfonate and hydrated lime is dehydrated and treated with superheated steam. Phenol is distilled, separated from the water mixture, and purified. The solid residue is taken up with the water, filtered, and washed, giving a solid calcium sulfite cake with most of the potash left in the solution as chloride with the sodium sulfite formed by the reaction.

Benzene sulfonic acid is then added to form the sodium salt (with the sodium sulfite present) and SO_2 is evolved and recovered. Lime is added in proper amount and the mixture evaporated and dried to repeat the cycle. The net result is that there is only a small makeup of caustic soda and a use of lime. The sulfuric acid used for sulfonation is recovered partly as SO_2 and partly as calcium sulfite, the latter having as yet no substantial value. The process works in the laboratory and is being tried on the pilot-plant scale abroad. There are severe engineering difficulties in the handling of the pasty masses of the operation and it is too early to determine whether these can be overcome.

The chemical economy of the process is marked but this may be more than counterbalanced by other operating costs. It would, however, give a sulfonation process which would not be limited geographically by the disposal of byproducts.

There is further another possible process which obviates the use of benzene. This is the air oxidation of cyclohexane to cyclohexanol and the dehydrogenation of the latter to phenol. The first stage is one standard large-scale method of producing nylon intermediates and the latter stage is known to be operable without difficulty and with good yields. Were cyclohexane available in quantity at a price below benzene, the method might be developed to an efficient and economic large-scale operation.

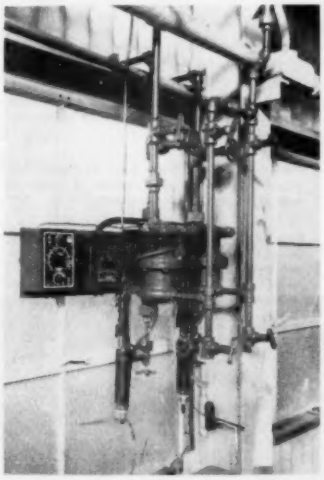
The direct oxidation of benzene by air to phenol has also been exhaustively investigated without positive economic results. It may be only a question of the right catalyst to give high yields and if such a process were developed, it would be revolutionary, certainly as far as any new enterprises are concerned.

Financial Picture Is Complicated

It can be seen that the economic situation surrounding synthetic phenol is quite complicated. It is probable that all four processes now in use will continue in operation on a competitive basis and they are not likely to be displaced by new developments in the foreseeable future. Older plants, partially or entirely depreciated, are likely to continue for a considerable period of time as the new capital necessary to replace them with a new plant would be difficult to justify.

Identify This Instrument!

THE Journal's candid cameraman, R. B. Ward, last week took a shot (3-minute time exposure, diaphragm setting f8.0, Super XX film, no flash) of this instrumentation hookup.

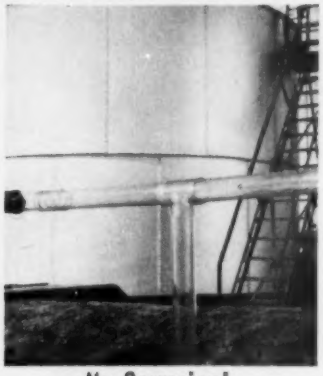


Can you identify it? Check the answer in the square below, then turn to page 158 to see if you are right.

- ☐ Analyzer for sulfur content of natural gas.
- ☐ High-low alarm, pH control indicator.
- ☐ Analyzer for boiler-scale control.
- ☐ Hot-cold control (thermostatic) of steam input to heating sections.
- ☐ Hot-cold control (thermostatic) of refrigerant input to cooling sections.

KRALOY
PIPE & FITTINGS

FOR WASTE WATER LINES, FLOW LINES, GATHERING LINES



No Corrosion!

Kraloy will not rust, is impervious to all types of soils, and is not subject to galvanic corrosion.

No Wax Build Up!

Kraloy has no affinity for waxes or paraffin.

Eliminates Scale

Practically all types of mineral deposits are eliminated.

Low-Cost Installation

Two roustabouts can lay 1000 feet of Kraloy per hour. No welding or field wrapping is necessary.

★ LIGHT-WEIGHT. Easier to handle. 8 times lighter than steel.

★ MANUFACTURED to IPS sizes.

★ TREMENDOUSLY GREATER carrying capacity than steel pipe due to smooth, frictionless walls.

Over 4,000,000 feet of Kraloy now in use. Type O—125 PSI W.P. Max. Type D—500 PSI W.P. Max.

STOCKED BY

National Supply Co. • HOMCO
Howard Supply Co. • Crane Co.

Write for latest specification brochure.

KRALOY PLASTIC PIPE CO.
4710 EAST WASHINGTON BLVD.
LOS ANGELES 22, CALIFORNIA
Branches: Casper, Wyo. & Houston, Texas

Kraloy Plastic Pipe Co., Inc.
4710 East Washington Boulevard
Los Angeles 22, California
Gentlemen: Please send me complete information on Kraloy Pipe and Fittings.

NAME_____
FIRM_____
STREET_____
CITY_____ ZONE___ STATE_____

Use of Salt Water in

LOGGING DRY SHOT HOLES

Here's a simple, cheap technique usable in this type of poor logging areas

by Thomas S. Hargest*

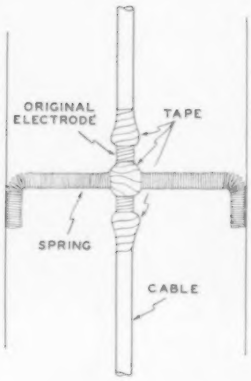


Fig. 1—Electrode for dry hole logging. The spring should be 4 to 6 in. longer than the nominal diameter of the hole. The caliper of air-drilled holes is fairly uniform with enlargements of more than 2 in. not to be expected.

LATE in the spring of 1951 while exploring an area of West Texas by reflection seismograph, Stanolind Oil & Gas Co. encountered an area in which record quality was very poor. With a desire to obtain higher-quality information, a program of shot-hole logging was begun. The area presented a difficult problem in logging due to a maze of subsurface fissures and cavities.

Satisfactory resistivity logging is usually done in water-filled holes. The water not only provides excellent electrical contact but also cleans the hole walls. However, in the locations to be logged, water would not stand within 120 ft. of the surface. Furthermore, it was necessary to drill with air in order to maintain circulation. Air drilling does not produce normal cuttings but rather a rock flour which adheres to the hole walls, reducing conductivity and eliminating sharp formation breaks.

The logging problem here was threefold: (1) to obtain satisfactory logs in holes which were dry to depths of 150 ft.; (2) to use a minimum of water since surface supplies were not available in large quantities; and (3) to improve electrical conductivity.

Instruments used . . . The equipment available for logging was the standard resistivity-type instrument consisting of a pair of amplifiers, one for each characteristic, and a recorder. The equipment had been modified for shot-hole logging, to use four short-spaced electrodes. These were located at intervals at the terminus of the rubber-covered logging cable. A 16-in. screen-door spring was fastened at right angles to each of the electrodes and the connections between the electrode and the spring were soldered (Fig. 1). This in-

*Geologist, Brown Container Co., Inc., West Monroe, La.

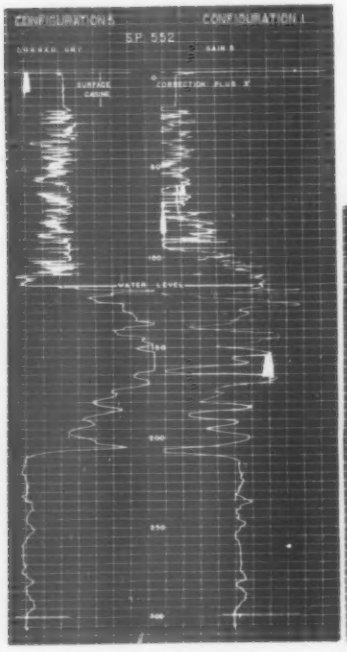
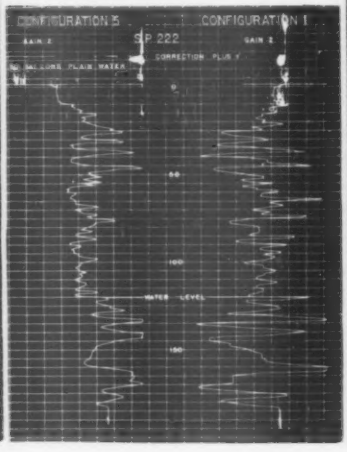
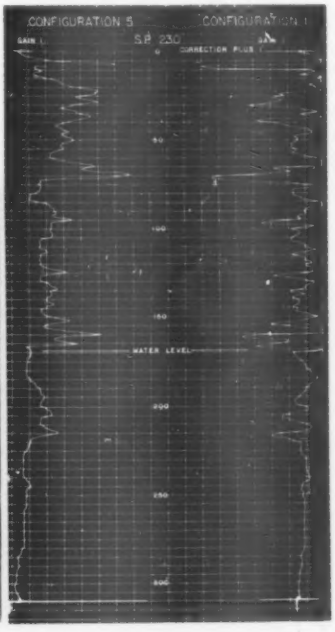


Fig. 2—(Left) Electrical log of a shot hole showing unsatisfactory recording above the water level.

Fig. 3—(Below) Shot hole electrical log made by using a small stream of water to wet the sides of the bore hole.

Fig. 4—(Right) Typical salt-water log using 10 gal. of salt solution sloshed down the hole. Note reduced gain settings.





VERIFIED

Producing *two*, positive, easily read records, the new Totco Double Recorder gives positive proof of Totco's well known accuracy. With VERIFIED accuracy you can be sure and double sure of "Straight hole" all the way. For complete description and prices contact our distributors today.

Totco DOUBLE DOUBLE *Recorder*

TOTCO

Be **SURE** *you know, use* **TOTCO**

Technical Oil Tool Corporation
1057 N. La Brea Ave., Los Angeles 38, Calif.

EXCLUSIVE DISTRIBUTORS:

California—The Republic Supply Co. of California
Domestic—The Continental Supply Company
Canada—Oil Well Supply Division
United States Steel Company
Export—Lucey Export Corporation, New York City

novation was developed by M. S. Graham, of Stanolind Laboratories, Tulsa. The spring made physical contact with the shot-hole walls. The spring adaption eliminated the necessity for water-filled holes in places where drilling was done with water. Logging was done while the walls of the hole were still damp.

Initial Logging Attempts

Efforts were made to obtain dry-hole logs but they were all unsuccessful as indicated by Fig. 3. An attempt was then made to introduce water into the hole. At first a large stream of water was used in order to wash the rock flour down the hole and to wet the sides sufficiently to provide good electrical contact. These logs, while good at some depth, showed a chattering effect near the surface. This is believed to have been caused by the heavy stream striking the electrodes and causing them to bounce within the hole. A log of this type required about 150 gal. of water which was considered excessive. Next a smaller stream of water was tried in an effort to eliminate the chattering of the electrodes and reduce the quantity of water used. This method, suggested by M. S. Graham, provided a satisfactory log (Fig. 3) and required only 50 gal. of water. Finally water was introduced by bucketful and a fair log resulted. Approximately 40 gal. of water was used.

This experimentation indicated that if any of the above-mentioned procedures were followed, it would be necessary to assign a water truck and driver to the electric-logging unit. This was considered unsatisfactory because of the limited water supply and the expense involved.

Answer Found

It was suggested that if a solution of high conductivity could be found, the quantity of liquid might be decreased and yet the quality of the log further improved. Several solutions were suggested but were eliminated because of cost or the harmful effect they might have upon the rubber-covered logging cable.

Salt water picked . . . A solution of sodium chloride and water was finally decided upon. This was chosen because it was an excellent electrolyte, inexpensive, readily available, goes into solution rapidly, and was least harmful to the cable. In most cases a salt-water log is very poor because it is such a good conductor that it produces an electrical short between electrodes. In this area, however, the very fissures which drained off the natural water and made logging difficult also drained off the excess salt water and only that which moistened the hole walls remained. This was theoretically what was desired, for it would still provide good electrical contact but would not short between the electrodes.

The first shot hole was logged with a solution of 1 lb. of salt per gallon of water. It was immediately apparent that the answer to the larger part of the problem had been found. Formation breaks were sharp and the electrode response was so much greater that the sensitivity of the instruments had to be reduced and amplitude cut to the minimum. (Note gain settings on Fig. 4.) In the following logs the ratio of salt to water was regularly reduced until a solution strength of ½ lb. of salt to 20 gal. of water was reached. The quality of the logs seem to deteriorate with weaker solutions, but there was no noticeable improvement as the solution strength was increased.

Details solved . . . Having determined the minimum amount of salt to water ratio, it was now necessary to determine the minimum amount of solution necessary to produce quality logs.

To further limit the amount of solution available for the last portion of the experiment, two 20-gal. tanks were mounted on the logging truck, one over each of the rear wheels. These tanks were filled with water and ½ lb. of ice cream salt was added to each. The drive to the area provided sufficient time completely to dissolve the salt in the water.

On this test, the logs were made with the small stream only. The first one was limited to 5 gal. of solution. This was insufficient to completely saturate the hole. The log was improved using 10 gal. but gaps were still apparent. The 10 gal. was then introduced in 5-gal. lots by bucket just before the logging was begun. This proved to be the answer, for the log was excellent with sharp and distinct formation breaks from the water level to the surface.

Results

Using this technique, over 60 logs were made in a confined area using various quantities of solution. At times four to six logs were made in the same hole with the salt content increased with each successive log. The logs showed no variations in breaks, hence it can be assumed that continued addition of salt does not affect the quality or accuracy of the logs.

Certain conclusions may be drawn from these experiments. A salt solution reduces the amount of water necessary to log a dry hole by about 80 per cent. Introducing the solution by the bucketful is superior to the stream method; apparently the water sloshing down the hole cleans the walls more thoroughly and wets them more evenly. The solution, though it reduces the resistivity of the formation, acts equally on all formations. In a log made with plain water, it was found that if the electrode response was twice as great in one formation as in another, the use of salt water in no way affects that proportion. Regardless of the amount of salt water added, the response of the one formation to the other will still be two to one. In air-drilled shot holes of a diameter of about 4 in., 1 gal. of solution should be used for about every 15 ft. of dry hole. This may vary depending on the formations encountered.

The hole-logging tests reported herein conclusively demonstrate that dry holes can be clearly and accurately logged if the hole walls are dampened with a salt-water solution. This is a simple and low-cost technique that can be used in this type of poor logging areas.

Acknowledgment

Appreciation is herewith expressed to Stanolind Oil & Gas Co. for permission to publish this article and to P. H. Garrison and M. S. Graham for their comments and assistance.

Answer to "Check Chart"

The puzzle picture appearing on page 155 of this issue is correctly identified as analyzer for boiler-scale control. It serves a large boiler installation in gas-treating plant, El Paso Natural Gas Co., Farmington, N. M. (San Juan basin area).

BOOK

EXECUTIVE PAY PLANS. By William J. Casey and J. K. Lasser. Published by Business Reports, Inc., 225 West Thirty-fourth Street, New York 1. 160 pp. $12.50.

In this study the authors have analyzed what companies can do to attract and hold good men and to focus on company operations much mental energy now devoted to worry about their future security and that of their families. In 15 chapters the volume details new techniques developed by major companies to reward executives through stock options, deferred pay and pension arrangements, family maintenance, expense arrangements, insurance, and other executive benefits. How executives can be aided to build capital and an estate, receiving incentives to stay and perform on the job, is shown in a detailed summary of workable and economical plans. The authors point out that the closely held company has an entirely different problem in attracting and holding executive talent from that of the large publicly owned business.

SWEEP IT CLEAN...
for faster drilling and more hole per bit

Rock bits drill faster and wear longer when the cutters are chipping on virgin formation rather than re-cutting formation already chipped loose.

REED Twin-Blast Rock Bits use the full energy of the mud stream to sweep the bottom of the hole clean. Powerful streams of drilling fluid blast cuttings up into the return mud stream.

This better bottom hole cleaning action means cutters are always working on virgin formation. This results in faster drilling, more footage per bit and lower drilling costs.

REED ROLLER BIT COMPANY

HOUSTON 1, TEXAS

3784

Another example of BARNES SERVICE to a fast-moving industry

"On Stream" in 6 months!

When the Shell Oil Company decided to increase output at its Brea, California natural gasoline plant . . . the Barnes organization was called upon to handle the engineering and erection work. New facilities included a new compressor station and additional absorption and distillation units. The entire work was completed in *six months time* and resulted in more than doubling the plant capacity.

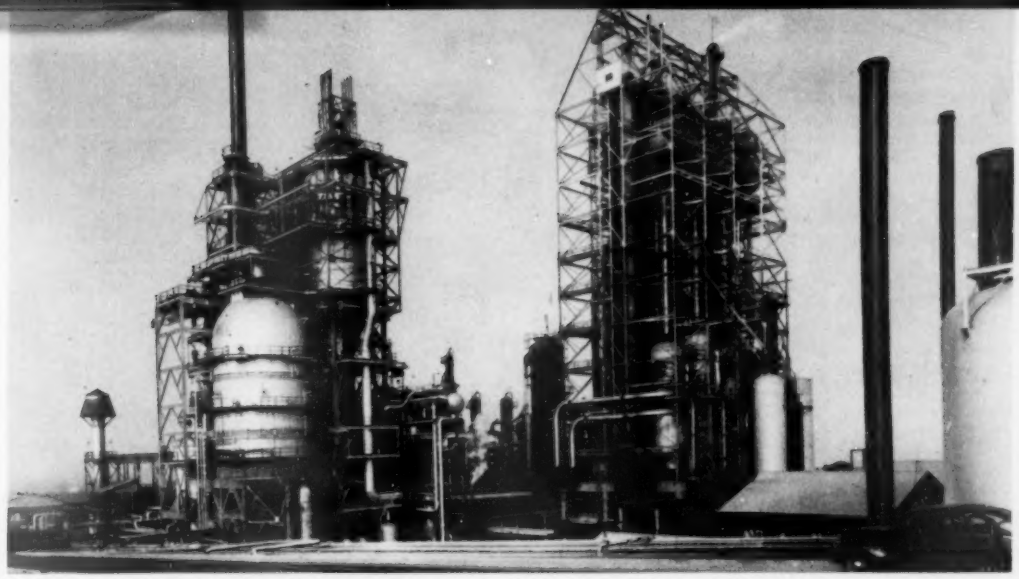
Barnes' record for getting things done quickly and smoothly is well known in the petroleum and petrochemical fields. The Barnes organization offers a complete service in designing, engineering and construction. It's a service you can depend on *from start to finish*. Why not check with Barnes on *your* next project?

▲ *View of the Shell Oil Company's natural gasoline plant at Brea, California*

BUILD WITH BARNES *from Start to Finish*

▲ A COMPLETE SERVICE
IN DESIGN, ENGINEERING AND CONSTRUCTION
FOR THE PETROLEUM AND PETROCHEMICAL INDUSTRIES

W. M. BARNES COMPANY
727 W. SEVENTH ST., LOS ANGELES 17, CALIFORNIA
IN CANADA
W. M. BARNES COMPANY OF CANADA, LIMITED
146 WELLINGTON ST., WEST, TORONTO, ONTARIO



NEW FLUID CAT CRACKER and attendant facilities at the Los Angeles refinery of Union Oil Co.

UNION OIL

Cat Cracker Gas Plant Expanded To Accommodate New Unit

Excess T.C.C. gas-plant capacity is utilized to process gas from new F.C.C. process; only additional major equipment required were a deethanizing absorber and two new 1,300-hp. compressors.

by Arnold E. Kelley* and Harry F. Poll*

EXISTING cat cracker gas-plant facilities at the Los Angeles refinery of Union Oil Co. have been expanded to process gas from a new fluid cat cracking unit. The only new major equipment required were a deethanizing absorber and two new 1,300-hp. compressors.

The modifications were possible because of excess capacity in the gas plant serving the existing Thermofor cat cracker. This spare capacity was the result of (1) an original overdesign factor of 20 per cent, (2) operation at lower conversion levels than originally designed, and (3) change from war operation of cracking and treating to cracking only.

The feed to the integrated gas plant consists of wet gas and wild gasoline produced from the catalytic sections of both

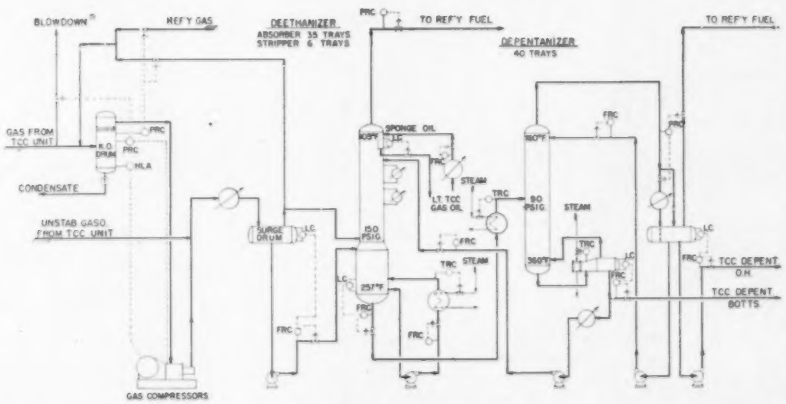


Fig. 1—T.C.C. gas-plant facilities.

*Union Oil Co., Los Angeles refinery. Presented before California Natural Gasoline Association annual meeting, Los Angeles, 1952.

the new F.C.C. unit and the original T.C.C. unit. The function of the plant is to separate the feed into the following product streams: (1) dry gas, (2) propane - propylene, (3) butane-butylene, (4) pentane - amylene, (5) light catalytic gasoline, and (6) heavy catalytic gasoline.

Three sections . . . The gas plant can be conveniently divided into three sections.

The first section (Fig. 1) is referred to as T.C.C. facilities. It receives the wet gas and unstabilized gasoline from the T.C.C. unit and processes them through a deethanizer and depentanizer to yield a dry gas to the refinery fuel gas system, a T.C.C. depentanizer overhead containing the C_3's, C_4's, and C_5's, and a T.C.C. depentanizer bottoms.

The second section (Fig. 2) is referred to as F.C.C. facilities. It receives the wet gas and unstabilized gasoline from the new F.C.C. unit, and in a manner similar to the first section, processes them to produce dry gas, an F.C.C. depentanizer overhead, and F.C.C. depentanizer bottoms.

The third section (Fig. 3) is referred to as combined facilities since here the T.C.C. and F.C.C. streams are commingled and processed through facilities common to both. The T.C.C. and F.C.C. depentanizer overhead streams are combined and processed through a depropanizer and debutanizer to produce propane-propylene, butane - butylene, and pentane-amylene streams. The T.C.C. and F.C.C. depentanizer bottoms streams are combined and fed to a single rerun tower where they are split into light and heavy catalytic gasoline streams.

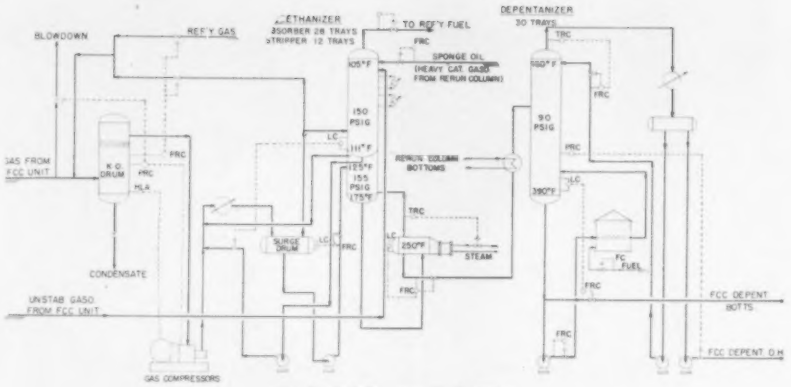


Fig. 2—F.C.C. gas-plant facilities.

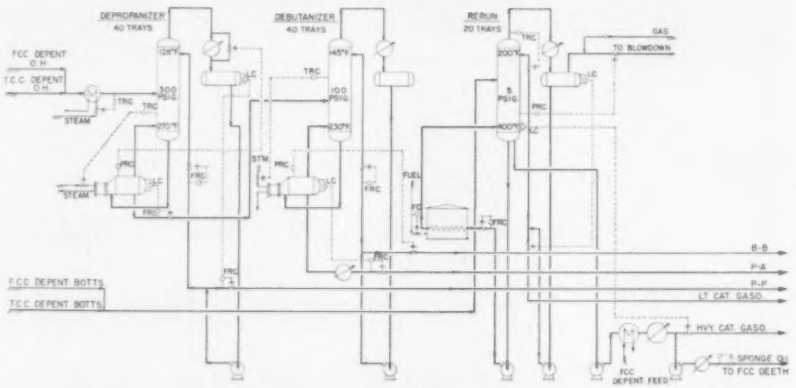


Fig. 3—Combined gas-plant facilities, processing product streams from both T.C.C. and F.C.C. units.

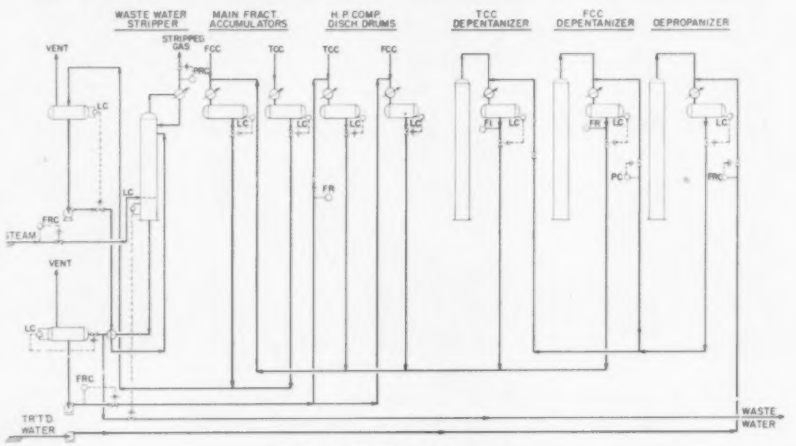


Fig. 4—Gas-plant water-wash system.

T.C.C. Facilities

Wet gas from the T.C.C. unit is received in a compressor suction knockout drum where entrained liquid is removed by a wire-mesh mist extractor. The knockout drum is equipped with a high level alarm and if the level continues to rise, the magnetos of the compressor engines are shorted, thus shutting down the compressors. Constant suction pressure on the compressors is provided by two pressure-recorder control instruments, one for above the control point and the other below.

SERVICE CONNECTION
ELL CONNECTION
TEE CONNECTION
COUPLING
PFC FIBERCAST PIPE
All Fibercast
TANK BATTERY CONNECTIONS
are now possible with the introduction of Fibercast fittings
Fibercast
Fibercast
Fibercast
Fibercast
Fibercast
Fibercast
"IT WILL PAY YOU TO USE FIBERCAST, TOO!"
PERMALOY Fibercast
CORPORATION
P. O. BOX 631 • SAND SPRINGS, OKLAHOMA • PHONE TULSA 2-7212
Export Office, 30 Rockefeller Plaza, New York 20, N. Y. Phone Circle 6-6260

Fingertip heat control

right at the work-with the P&H Welding Twins

equipped with Dial-lectric Control

Dial-lectric Control is an exclusive P&H feature that helps you weld faster, easier, better — at less cost!

P&H AC WELDER

As easy as tuning your radio — just turn the radio-type knob of the Dial-lectric Instantaneous Remote Control (or step on a foot treadle), to adjust heat accurately. Easy, quick-start arc. No hard-working cranks to turn. No moving parts to cause delays or maintenance expense. Sizes up to 625 amps., NEMA rated. Connectable to 220 and 440 volts.

P&H DC RECTIFIER WELDER

Also equipped with hand-or foot-operated Dial-lectric Control, to give the welder fingertip heat control at the work. No hard-working cranks to turn. No moving parts to wear out. Saves on power costs under load — and during idle and no-load periods. Protects the primary input line against unbalanced conditions. Three sizes, 200, 300, and 500 amps., NEMA rated.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
4527 WEST NATIONAL AVENUE • MILWAUKEE 46, WISCONSIN

the P&H Line

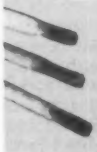
2494

P&H

Welding Equipment

speeds production schedules, cuts costs

P&H LOW-HYDROGEN ELECTRODES



13 types for high-strength welds on problem steels, steel castings, nickel-alloy steels, chrome-moly steels, .40 carbon castings, high-hardenable steels, aircraft and similar steels.

P&H POSITIONERS

Position heavy weldments for economical down-hand welding. Complete range of sizes to handle work from 2500 to 36,000 lbs. — remote-control and hand-operated models.

P&H WN-301
Engine-Driven
DC ARC WELDER

2- or 4-Wheel Mountings

Portable. Equipped with Dial-electric Control, for fingertip heat control at the work — gives you faster, better welding. Runs at only 1750 rpm. Welding service range, 60-375 amps, NEMA rated.

Ask your P&H representative or distributor for complete information, or write for free bulletin.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
4527 W. National Ave., Milwaukee 46, Wis.
3494A

The action on high pressure is to first speed up the compressor and after reaching maximum speed to vent gas to blowdown. When the pressure drops, the compressor speed is gradually reduced, and if the pressure continues to drop, the second instrument opens first one control valve which recycles compressor discharge and if necessary, a second, which lets refinery fuel gas into the system.

The gas is compressed in two-stage compressors to 160 psig. and joined by the T.C.C. unstabilized gasoline, as it flows through coolers to the T.C.C. deethanizer surge drum.

Vapors from the surge drum pass upward through the absorber section of the column, contacting absorption oil (depentanized gasoline from the T.C.C. depentanizer). The top five trays are a sponge section where any small quantities of absorption oil carryover are recovered by sponge oil (light T.C.C. gas oil). Dry gas is produced overhead under pressure control. After scrubbing with diethanolamine for the removal of H_2S, it enters the refinery fuel-gas system. Rich sponge oil is trapped out on a sealed pan and returned to the main T.C.C. fractionation system. Two intercoolers remove heat from the absorption section.

Liquid from the deethanizer surge drum enters the stripping section of the column and passes downward together with the rich absorption oil. In this section ethane and lighter are stripped from the liquid. A steam reboiler provides heat to the bottom of the deethanizer. The basic control instrumentation is shown on the diagram and requires no explanation since it is a typical installation.

The deethanized gasoline from the bottom of the T.C.C. deethanizer flows through a steam preheater into the T.C.C. depentanizer where it is separated into an overhead of pentanes and lighter and a bottoms of depentanized gasoline. Heat is supplied to the bottom of the tower by a steam reboiler. A cold reflux ratio (reflux to net product) of about 1.5 is used.

Novel pressure control . . . In the redesign by Universal Oil Products Co. of the catalytic gas plant to adapt it for use with the F.C.C. facilities, a very successful method of pressure control for this tower was employed. Under normal conditions the depentanizer is operated total condensing. Tower pressure is controlled by a butterfly valve on the overhead vapors flowing to the condenser. The liquid inlet line from the condenser projects downward below the level in the accumulator drum and an equalizing line connects the top of the accumulator to the deppentanizer overhead line upstream of the control valve.

This arrangement establishes a pressure in the accumulator which is equal to that in the tower overhead line, irrespective of the temperature of the liquid in the accumulator drum. If, for example, an upset occurs which tends to decrease the tower pressure below the control point, the butterfly valve in the overhead line is throttled until the pressure builds back up to the control point. The equalizing line forces liquid up the line between the condenser and accumulator to a height equivalent to the pressure drop across the control valve.

This system permits more rapid response to pressure upsets than does one that requires changing the temperature of the accumulator liquid until it gives the desired equilibrium pressure. It also provides for more reliable pump suction conditions on the reflux and overhead product pumps. When the tower is producing noncondensables, however, the equalizing line is blocked closed and the pressure is controlled by a motor valve relieving accumulator gas to the refinery fuel system. This alternate is also shown in Fig. 1.

F.C.C. Facilities

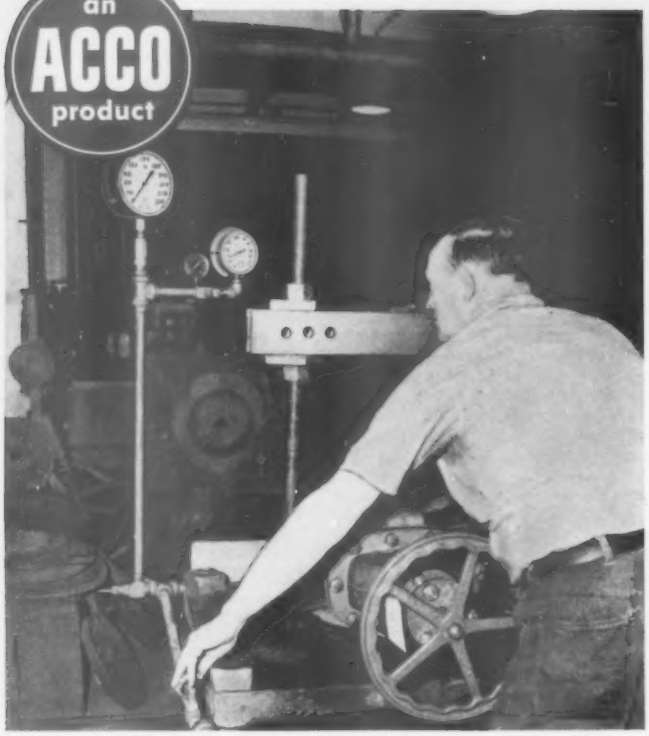
The wet gas from the F.C.C. unit is received in a knockout drum and compressed to 160 psig. exactly as described for the T.C.C. facilities.

The F.C.C. deethanizer is actually a double tower, consisting of an upper absorption section and a lower stripper section. The vapors discharging from the compressors are recombined with the overhead from the stripper section and the bottoms from the absorption section giving one additional theoretical contact. The combined vapor-liquid stream flows through a precooler and into the deethanizer surge drum. The vapors from the surge drum enter the bottom of the absorption section and in ascending the column are contacted by the unstabilized F.C.C. gasoline which serves as absorption oil.

The use of wild gasoline as absorption oil makes it possible to get both stripping and absorption in the absorption section, thus increasing the effective height of the stripping section and making possible the production of an ethane-free liquid from the bottom of the column. Heavy cat gasoline from the rerun unit is used as sponge oil in this column, and as with the T.C.C. deethanizer, two intercoolers remove heat from the absorption section. The dry gas produced overhead is scrubbed for removal of H_2S before flowing into the refinery fuel-gas system.

The liquid from the deethanizer surge drum is pumped into the top of the stripper section. Heat is supplied to

an ACCO product



Why HELICOID Gages Prove So Dependable, So Much Longer...

● Hydrostatic testing of valves on production lines gives gages a continuous workout. Every few minutes, all day long, high pressure water is run into valve after valve. Each time the gage surges up, levels off, and then suddenly drops back to zero.

Wear on gear teeth would be a constant headache—BUT not with a HELICOID Gage because—*it doesn't have teeth!* A simple stainless steel roller and long life cam absorb the surges and practically eliminate wear. Consequently, a HELICOID Gage after thousands of cycles is just as good as the day it was made.

Here you see Helicoid Gages on a hydraulic application. You can also get HELICOID Gages for pressure, vacuum, or compound service—in all pressure ranges; in various sizes and shapes; with black, white, and radiant faces; wall, stem, flush, and panel mountings, or flangeless cases.

Write today for full details on HELICOID Gages —they retain original accuracy longer, last longer, cost less per gage, per year.

ACCO

HELICOID GAGE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

929 Connecticut Avenue • Bridgeport 2, Connecticut

HELICOID Pressure • Vacuum GAGES

the bottom of the column by a steam-heated reboiler. The ethane-free bottoms are exchanged against rerun column bottoms to obtain preheat and fed into the F.C.C. depentanizer.

In the F.C.C. depentanizer, the deethanized feed is separated into an overhead product containing pentane and lighter and a bottoms product of depentanized gasoline. Heat is supplied to the bottom of the column by a fired reboiler and a cold reflux ratio of about 1.5 is used. This column is not equipped as yet with the more desirable pressure-control system described previously; however, reasonably satisfactory control is obtained by the flooded reflux system shown.

In this system the reflux drum, part of the condenser, and the line between them contain liquid. The height of liquid in the condenser is varied to expose more or less condensing surface by a pressure controller which throttles the pump discharge of overhead product. Thus, if the pressure rises above the control point, the control valve opens further and more product is pumped away. This lowers the liquid level in the condenser, exposing more surface with which to condense vapors, thereby reducing the pressure back to the control point.

Combined Facilities

The T.C.C. depentanizer and F.C.C. depentanizer overhead streams are combined and flow through a steam-heated preheater into the depropanizer. The liquid propane-propylene stream taken overhead is split to provide a cold reflux ratio of about 4 and a net production which goes to diethanolamine scrubbing for H_2S removal. Heat is supplied to the bottom of the column by a steam-heated reboiler.

The column pressure is controlled by a hot bypass around the overhead condensers. One disadvantage of this control, which was not modified from the original design, is as mentioned before, that the large inventory of liquid in the accumulator drum must reach a temperature which will give the desired equilibrium pressure, making response sluggish.

Depropanizer bottoms are pressured into the debutanizer for separation into an overhead butane-butylene product and a bottom pentane-amylene product. A cold reflux ratio of about 1.5 is used in the debutanizer and heat is supplied to the bottom of the column by a steam-heated reboiler. The debutanizer is operated on flooded reflux and pressure control in a manner already described for the F.C.C. depentanizer.

The T.C.C. depentanizer and F.C.C. depentanizer bottom streams are combined and fed into the rerun column or gasoline splitter. The rerun over-

head, or light catalytic gasoline, is split into two streams. One refluxes the tower with a cold reflux ratio of about 0.6 and the other goes to treating and inhibiting for use as a gasoline blending stock. Heat is applied to the bottom of the column by a fired reboiler, a separate section of the same heater that reboiled the F.C.C. dependentanizer.

The rerun bottoms, or heavy catalytic gasoline, is cooled first by exchange against F.C.C. dependentanizer feed, then against water. It is then split into two fractions. One fraction is pumped under flow control to the F.C.C. deethanizer where it serves as sponge oil; the other fraction, or balance, goes to treating and inhibiting for use as a gasoline blending stock.

Product recoveries and compositions . . . The light ends recoveries in this unit are 70 per cent for the propane-propylene, 95 per cent for the butane-butylene, and 99+ per cent for the pentane-amylene.

The composition, or purity, of the streams are about as follows:

	Per cent mol.
1. Propane-propylene:	
C_2 minus	10.0
C_3	10.0
C_4	1.0
Total	100.0
2. Butane-butylene:	
C_3	1.5
C_4	97.5
C_5	1.0
Total	100.0
3. Pentane-amylene:	
C_4	1.0
C_5	97.1
C_6	1.9
Total	100.0

Gas-plant flexibility . . . Considerable operating flexibility is afforded by a bypass arrangement which permits continued production of stabilized gasoline in the event one or more towers are shut down for repairs.

Briefly, jumpover lines permit the bypassing of the T.C.C. deethanizer and/or T.C.C. depentanizer, and running the combined feeds through the corresponding F.C.C. towers, or vice versa. Where necessary production rates have to be cut back to accommodate limiting tower loadings, however, a costly total shutdown of the cat crackers can be avoided. This bypass arrangement also helps in the startup of either the F.C.C. or T.C.C. cat cracker. When either of the cat crackers is being readied for a startup some of the reactor products from the operating unit can be prematurely bypassed into the gas plant of the other. Thus, its deethanizer and depentanizer can be brought on stream, ready to take over when its own cat cracker starts to produce feed.

When any of the towers of the combined facilities are shut down, that is, depropanizer, debutanizer, or rerun, operation of those remaining can be continued. In some cases it may be necessary to reduce rates.

To illustrate, if the depropanizer were bypassed due to shutdown, the deethanizers would be operated to produce propanes overhead to fuel gas. The debutanizer would not be capable of total condensing operation and a propane-rich gas would be pressure controlled overhead from the debutanizer overhead accumulator into the refinery fuel-gas system.

If the debutanizer were bypassed due to shutdown, several alternates are available. Pentanes could be left in the depentanizer bottoms and the combined propanes and butanes then comprising the depentanizer overhead run to butane production. This also bypasses the depropanizer. Another alternate would be to operate the depropanizer on the propane-butane mixture to effect a split between them. In either case, pentanes would be produced with the light gasoline at the rerun unit.

Operating difficulties experienced . . . It is believed to be of interest to point out a few of the operating problems that have been experienced in the plant.

Compressor cylinder walls were be-

GOODALL

"LONG LIFE" STYLE D-115. An improved wrapped duck construction that has greater flexibility, is lighter in weight and coils flat on the reel. Synplastic cover prevents moisture penetration and provides exceptional resistance to abrasion, oil and sun rays. Sizes 1½", 2" and 2½".

COTTON RUBBER LINED. Single or Double Jacket. Well-known for its superior strength and lasting qualities. Long-fibre cotton duck jacket withstands hard wear and rough treatment, and resists snagging and puncturing. Tough, durable rubber lining. All standard sizes.

"INFERNO" STEAM HOSE. For fire smothering. Wire braid construction with red synplastic cover.

Contact Our Nearest Branch for Details and Prices

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia · New York · Boston · Pittsburgh · Chicago · Detroit · St. Paul · Los Angeles San Francisco · Seattle · Portland · Salt Lake City · Denver · Houston · Distributors in Other Principal Cities

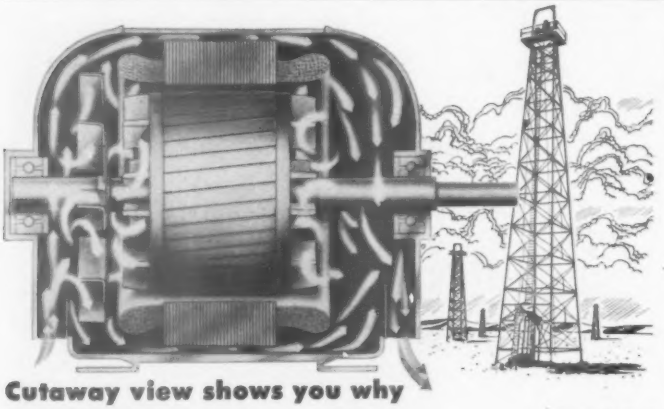
Est. 1870

Goodall Rubber Company of Canada, Ltd., Toronto.

ing badly scored in early operations, particularly in the high-pressure stage. The problem was analyzed and attributed to condensation of heavy ends in the wet gas with a resultant "washing away" of the lubrication on the cylinder walls. An attempt was made to find a lubricant which would resist this action and alleviate the trouble, but without success. It was then decided to raise the cooling-jacket water temperature to 130°-140° F. from its former 100°-110° F., to minimize condensation. The result was completely successful and no further trouble has been encountered.

Another early compressor problem was an excessive breakage of valves, also predominantly in the high-pressure stage. The valves being used were steel, 12 per cent chrome. Several theories were advanced for the cause, including hydrogen embrittlement and liquid entrainment. Although it is not possible to state a definite cause, the problem was eliminated by switching to Micarta plastic valves.

Another early problem was the plugging of instrument lines on the depropanizer resulting in false readings of levels, flow rates, etc. The trouble was quickly identified as due to H_2S hydrate formation and eliminated by steam tracing the instrument lines.



Cutaway view shows you why

R&M Oil Country Motors run COOL!

"Clean-sweep" ventilation insures longer motor life

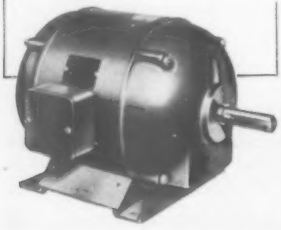
There's an R&M "All-Weather" motor that's built for YOUR job!

Triple-Rated—for changing power needs. Slight additional cost is quickly written off by power savings. You buy power only for the connected horsepower you need. As requirements change, you change the horsepower—*without changing motors.*

High Slip—ideal for the reciprocating load requirements of oil pumping.

High Torque—to meet heavy starting problems.

Standard Integrals—from 1 to 125 horsepower.



...and greater stamina for overloads

Cool running—hour after hour at full capacity—is one of the big reasons why so many oil field men swear by R & M "All-Weather" Motors. These motors are designed to permit ample circulation of high velocity air—to carry off motor heat, as well as heat developed by exposure to the hot sun. And, openings are drip-proof, rain-proof; screened to keep rodents out. Special treatment inside and out resists rust and corrosion. Heavy duty bearings are sealed to retain lubricant. In short, here are motors that will give you years of faithful service.

It will pay you to get the whole story!

Write today for name of your nearest R & M distributor. He can prove—in dollars and cents—that all these "extras" in R & M motors are furnished *at a standard motor price!* Be sure to ask for R & M bulletin on oil field motors; it's packed with good, usable information.

R&M "All-Weather" Oil Country MOTORS

ROBBINS & MYERS, INC.
Springfield 103, Ohio • Brantford, Ontario

"All-Weather" is the trademark of Robbins & Myers, Inc.

Wash-Water System

The function of the wash-water system, shown in Fig. 4, is to minimize hydrogen metal attack on the gas-plant equipment, an important problem with F.C.C. operators everywhere, and especially those using heavy California stocks which are comparatively high in nitrogen and sulfur content. The effect of this attack is to make the metal brittle and to cause blistering and surface fissuring (Effinger et al., "How Hydrogen Attacks and Damages Steel in Refinery Equipment," The Oil and Gas Journal, May 17, 1951).

Attack is caused by atomic hydrogen penetrating or diffusing into the metal where it associates into molecular hydrogen which cannot diffuse back out. Internal pressures are built up until failure of the metal results. The atomic hydrogen is liberated from water by galvanic corrosion cells on the metal surface, that is, it occurs only where moisture is present. It has been found that certain ions actively promote the acceptance of atomic hydrogen by the metal, one of the worst offenders being the cyanide ion. Apparently the F.C.C. process converts some of the nitrogen in the feed stock into the cyanide ions.

Two possible solutions to the problem of hydrogen attack consist of either eliminating the galvanic corrosion, or eliminating the cyanide ion promoter. The latter is the more simple and is effected by water washing the hydrocarbon streams for removal of the cyanide ion.

Fig. 4 shows how this has been done in the Union gas plant. Treated water first enters the depropanizer overhead line and collects in the accumulator drum. From the depropanizer accumulator drum it splits into two streams, one going to each of the depentanizer overhead lines. From the depentanizer accumulator drums, the wash water flows to the main fractionator column overhead accumulator at F.C.C. unit.

A second wash-water system consists of water from the bottom of the waste-water stripper. This stream splits, a portion going to the compressor discharge from each unit. This water collects in the F.C.C. and T.C.C. compressor discharge drums and is returned to the F.C.C. main fractionator column overhead accumulator drum along with the stream from the depentanizer overhead accumulator drums. The water from the entire system then goes to a settler for oil removal. From there it is pumped to the waste-water stripper as shown in the diagram, where it is stripped with steam to remove hydrogen cyanide, ammonia, and hydrogen sulfide. The stripped gases are discharged through steam traced lines into a fired heater and burned.

Portable Submersible Tank-Battery Barge

(Continued from page 141)

yard. When the barge hull is completed, steel columns are erected on the deck, and the tank, weighing some 60 tons, is lifted into position by two gantry cranes. A boat landing is provided a few feet above the lower deck, and an access stairway is provided from the boat landing to the upper deck.

The barge is launched in the same manner as any other vessel. In spite of its top-heavy appearance, it is quite stable, and has no more tendency to turn over in launching than do most other vessels of similar size.

The equipment on the upper deck is installed after launching. This includes equipment normally used in connection with a land tank battery, but also many other items needed only on water installations.

Separators . . . A 12-well manifold on the deck of the barge selectively directs the flow from the producing wells into two 480-psi.-working-pressure horizontal separators. A 24-in. by 10-ft. separator is intended to handle the normal lease production, and a smaller 16-in. by 10-ft. separator is for test purposes and emergency use. Both separators are unit mounted on skids, complete with meter runs, orifice meters, orifice fittings, and pilot controls for regulating equipment.

Control equipment will automatically close in all wells on the lease when the separator pressure rises too high or falls too low, when the separator fluid rises too high, or when the tanks are full. A gas engine, also mounted on the deck, powers a pump to provide sea water for flooding the tanks in event of an impending hurricane. Because of the high lift, a deep-well pump is used for pumping sea water. One of the columns supporting the tank serves as casing for the "well." A smaller engine drives an oil transfer pump to transfer or circulate oil, or to pump out tank bottoms.

Setting . . . After the tank battery barge is completed, it is towed to the site at which it is to be used. The barge is submerged by flooding one end of the hull until it rests firmly on the bottom, then flooding the entire hull until the barge is resting flat on bottom and the barge is completely full of water. Sea water may be used for flooding the hull, but it is more desirable to use fresh water because of the corrosive nature of sea water.

"With the deck submerged, the waves roll through the open structure above the deck unimpeded and exert minor forces on the barge."

It is very important that one end of the barge be lowered first, because if the deck of the barge hull were permitted to be completely covered with water before one end touched bottom, the vessel would become unstable and tend to turn over. Of course if the hull depth were greater than the water depth, it would not be necessary to lower one end before the other. The success of the tank battery barge is partially dependent, however, upon the deck of the hull being submerged when in use. An exposed hull would provide a solid wall in the water, upon which the waves would beat continually. The force of wind-driven waves is tremendous, and storm waves would give an exposed hull a severe beating, and probably move the entire barge. With the deck submerged, the waves roll through the open structure above the deck unimpeded, and exert relatively minor forces on the barge.

Once on bottom, the barge is used like a conventional tank battery. It is used only to store oil, never to transport oil. Flow lines from the wells are connected to the manifold on the barge. When the storage space is full, the oil may be unloaded by gravity flow into an oil transport barge, or may be pumped to a pipe line.

When it becomes necessary to refloat the barge, the water in the hull may be ejected by admitting compressed air to the hull. The refloating operation is performed in the same manner as the submerging operation—one end first.

Although most of the submersible barges are expected to remain for years at the site at which they are originally installed, they can easily be moved when circumstances so dictate. One of the Sunray barges in Corpus Christi Bay was initially installed in a tract where the field did not develop as expected. In less than 12 hours, the barge was refloated, towed 3 miles to a new location, and resubmerged.

The advantage of mobility is not entirely confined to oil fields in the developmental stage. At the depletion of offshore oil fields, governmental regulations dictate that all obstructions be removed from the waterways. The submersible tank battery is far cheaper to salvage than are piling platforms, and more salvage value is realized.

● Complete facilities including heavy duty hydraulically tested tank nozzles; efficient double elbow type swing joints that minimize agitation and pressure drop; sturdy steel swing pipe clamps; cables; internal sheaves or cable sheave bracket assemblies complete with bronze gland stuffing box; and internal or external tank winches. Fully descriptive catalog gives full details. *Write for a copy today.*

OCECO TANK FITTINGS
THE JOHNSTON & JENNINGS CO.
division of PETTIBONE MULLIKEN CORP.
4751 West Division St. • Chicago 51, Illinois

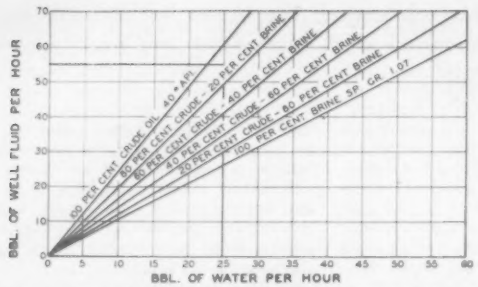

BBL. OF WELL FLUID PER HOUR
BBL. OF WATER PER HOUR
60 PER CENT CRUDE OIL 40 ° API
60 PER CENT CRUDE - 20 PER CENT BRINE
60 PER CENT CRUDE - 40 PER CENT BRINE
40 PER CENT CRUDE - 60 PER CENT BRINE
20 PER CENT CRUDE - 80 PER CENT BRINE
100 PER CENT BRINE SP GR 1.07

Fig. 1—Barrels of water per hour equivalent to barrels of well fluid per hour for a given well fluid composition. (Based on 40° A.P.I. gravity oil at 60° F.).

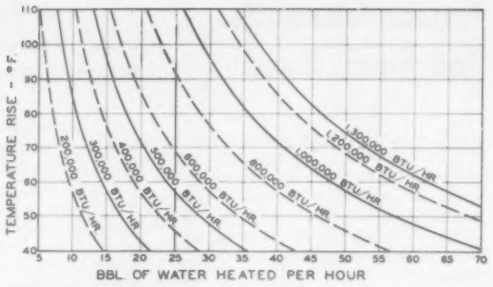


Fig. 2—British thermal units per hour required for increments in water temperature.

PRODUCTION POINTER

Engineering Factors in Heater-Treater Selection

ONE of the most important steps to be taken in solving an emulsion-treating problem is the selection of the proper size and type of equipment. The two major factors controlling the selection of an emulsion treater are the *heat capacity required* and the *maximum quiet settling time* allowed a given volume of oil.

Heating-Capacity Selection*

Any treater can be selected for the heating capacity alone and in a majority of these installations the unit will perform properly. In some cases, however, the emulsion may require a longer settling time than is allowed under the operating conditions imposed on the unit. It is therefore advisable to check the oil-settling time in selecting a treater before the equipment is ordered to avoid mistakes.

Required data . . . The following information must be obtained in order properly to determine the heating capacity required of an emulsion treater under any specific set of conditions. (1) Total volume of well fluid to be treated in barrels per hour; (2) composition, by volume, of this well fluid in percentages of oil and water; (3) initial temperature of the fluid as it enters the treater, in ° F.; (4) treating temperature required to break the emulsion, in ° F.; (5) maximum volume of clean oil to be treated, in barrels per hour; and (6) average settling time required to break the emulsion.

Fluid conversion . . . Variations in the composition of the well fluids from different fields and wells make it impossible to arrive at a simple formula for calculating the required heating capacity directly for all cases. If the volume of well fluid to be considered could be converted to an equivalent volume of a standard liquid, the procedure will be greatly simplified.

To simplify this conversion, Fig. 1 has been prepared. The following procedure should be used:

1. Determine number of barrels of well fluid to be heated per hour and find corresponding point on the left-hand margin.
2. Follow horizontal line from this point to the right until it intersects the slanting line representing the percentage composition parameter (volume of the oil and water in the well fluid).
3. Follow vertical line through this intersection downward to the bottom margin of chart.
4. Read the equivalent barrels of water per hour at intersection of this vertical line and margin of the chart.

Finding Heating Capacity

To simplify the determination of heating capacity required for any volume of well fluid, use Fig. 2. The following steps should be taken:

1. Values along the bottom margin of the chart represent barrels of water per hour. Using the barrels of water per hour found from Fig. 1, draw in corresponding vertical line on Fig. 2.
2. The values along left-hand margin of Fig. 2 represent the required temperature rise in ° F. After determining required temperature rise for the emulsion to be treated, draw in the corresponding horizontal line. The temperature rise is difference between the initial fluid temperature and the required treating temperature.
3. Determine point of intersection of these two lines.
4. This point of intersection will probably fall between two of the curved lines on Fig. 2 representing the heating capacity of the four emulsion-treater sizes. By interpolating between the curved lines the actual heating capacity can be found.

Keeping the heating capacity required in mind, turn to a table of specifications for the type treater already chosen and select the treater with the next larger heating capacity.

Settling time . . . It is always advisable to check on the settling time available in any installation. For this calculation the following information will be needed:

1. Maximum volume of clean oil to be treated in barrels per hour.
2. Average settling time required to break the emulsion.
3. Maximum oil-settling volume, taken from the specifications for the treater selected above.

The available settling time can be found by dividing the maximum oil-settling volume by maximum volume of emulsion produced per hour from the well. The result will be the actual time available for the emulsion to settle out. If this time period compares favorably with the average settling time required to break the emulsion, the treater selected will handle the emulsion effectively.

If the available settling time is too short, one of the following three considerations is recommended:

1. Select a larger size treater of the same type.
2. Consider use of the same size treater in a more advanced type.
3. Consider installation of excelsior if it has not already been specified.

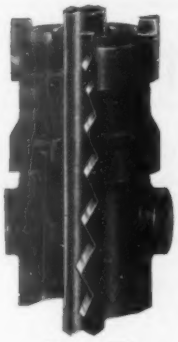
Acknowledgment

Material from Parkersburg Rig & Reel Co., pressure vessel operations department, Houston.

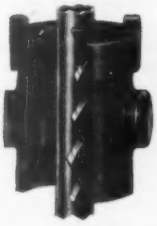
*The available settling time as calculated above is only the time during which the heated oil is actually rising through the clean oil-settling chamber.

SPECIFY THE LARKIN *All Purpose* FORGED STEEL TUBING HEAD

For Medium Pressure Wells



Type SR



Type R

Type M

Larkin *All-Purpose* Forged Steel Tubing Heads, illustrated here in three basic types, are adaptable to any flowing, gas-lifting or pumping system. All standard and accessory parts are interchangeable within the head body, providing easy conversion when varying conditions make necessary a change in the hook-up. Either mandrel or slip-type suspension may be employed.

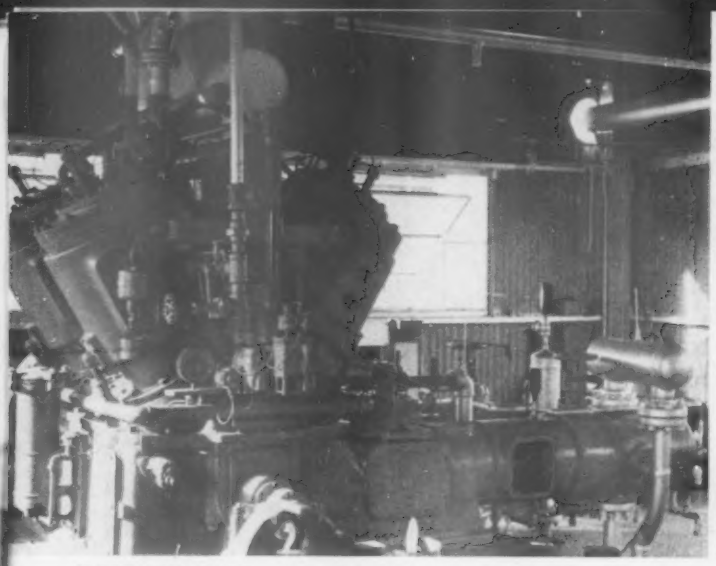
All Larkin Tubing Heads are full opening and are rated at 4500 p.s.i. test. The durable neoprene stripper provides ample blow-out protection during completion or work-over operations.

For economical, efficient service during the entire life of your well, specify Larkin Forged Steel Tubing Heads.

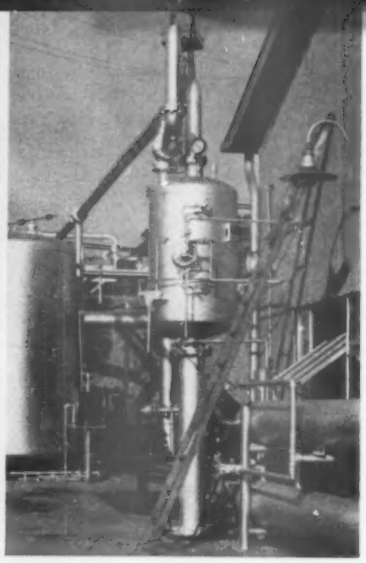
LARKIN PACKER CO., INC. ST. LOUIS, MO.

Buy... **LARKIN**

...Through Your Supply Store



OBSERVATION PORTS were installed at valve ports of test engine. These pyrex-covered windows may be seen near center of cylinder on right.



Steam separator used in tests with the four-cylinder engine shown at left.

ENGINE COOLING BY EBULLITION

by O. B. Freeman*

"An increase in thermal efficiency of around 40 per cent is noted. This increase is in the form of waste-heat-recovered steam from compressors which is currently being used in heating crude oil preparatory to dehydration."

ENGINE cooling by heat transfer to boiling water is efficient and practical. Advantages over the usual method of heat removal as sensible heat of the liquid water coolant include:

1. Cylinder liners and cylinders are cooler and at a more uniform temperature. This results in increased engine power.

2. Greater heat-transfer rates are obtained. Heat-transfer surface requirements are thus reduced, resulting in greater economy.

3. Overloadings of 10 to 20 per cent may be used for safe daily operation.

Tide Water tests . . . The problem of engine cooling by ebullition has been explored by Tide Water Associated Oil Co. in a series of laboratory and field tests. Results to date have been completely satisfactory, resulting in modification of a large number of engine units to provide for ebullient cooling.

The first consideration was given to the method of feeding the water to the heat-transfer surface. Cooling by ebullient transfer should produce a very low temperature rise across the engine. Thus, coolant water is returned to the engine at a point so near the boiling temperature that agitation of a pump impeller would cause cavitation, resulting in very poor pump performance. From this consideration, use of a pump was ruled out.

Thermosiphon circulation was also investigated. The application of this principle, however, calls for a straight-line pressure drop across the engine. With ebullient cooling, the pressure-drop pattern is fluctuating as shown in Fig. 6. From this consideration, thermosiphon circulation was ruled out.

Boiler analog . . . The single-drum water-tube boiler provides an application of thermal laws that guarantees a sufficient or surplus quantity of water to cool an engine during ebullient cooling. As shown in Fig. 1, an engine-cooling system can be patterned after boiler construction.

In the boiler, steam is generated in a set of sloping tubes or legs, installed within a fire box. In the generation and passage of steam up through these tubes, water is picked up and carried along in large quantities. At the top of these sloping tubes, horizontal lines carry steam and water to a drum. The large quantity of water necessitates installation of baffles in the drum in order to secure separation of water and steam. Steam escapes through the top of the drum and the water drops from the drum bottom through a second set of vertical tubes or legs to bottom of the first or sloping legs, completing the cycle.

If the engine water jackets are compared with the sloping tubes, and the firing chamber of the cylinders with the fire box of the boiler, only a steam separator with enlarged line from the top of the engine to the separator and a second leg from the bottom of the separator to the engine water inlet need be added to duplicate the circulation pattern in the ideal water tube boiler.

Water circulation . . . Since the steam separator is installed above the engine, the jacket plus the vertical section of the discharge line becomes the lighter fluid leg. The line from the bottom of the separator to the engine then becomes the heavier or solid water leg. Circulation is a function of the difference in density of the two legs.

The velocity may be measured using the Torricellian formula, $V = \sqrt{2gh}$ or for ordinary calculations, $V = 8\sqrt{h}$

*Tide Water Associated Oil Co., Ventura, Calif. Presented before California Natural Gasoline Association, Los Angeles Chapter, January 1953.

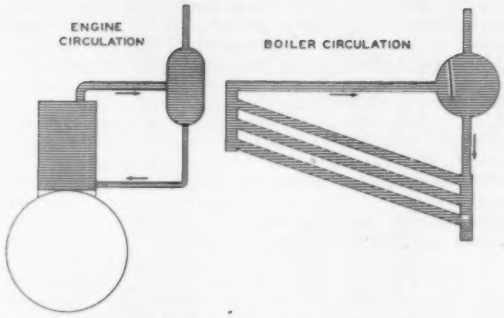


Fig. 1—Comparison of engine and boiler circulation systems.

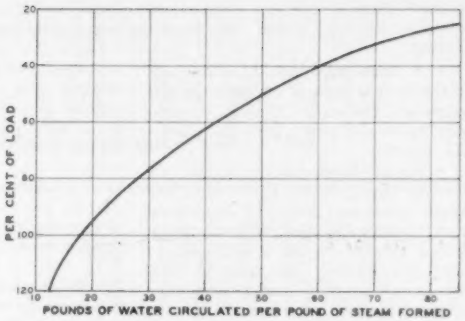


Fig. 2—As engine loading increases water carry over decreases.

h being measured in terms of the lighter fluid, in this case, steam.

Using the above rule, circulation may be calculated fairly accurately, provided no bad obstructions are allowed in the circulatory system. These calculations show a very large surplus of water carried over at low engine loadings. As the loading increases, the water carryover decreases in almost direct ratio. These calculations were borne out under actual working conditions. Water circulation at various loads is shown in Fig. 2.

On a 150-b.hp., 4-cylinder, 4-cycle compressor engine, using boiling heat-transfer cooling, an orifice meter was installed on the solid water leg. Condensate was measured through another meter, as it returned to the engine from the condenser.

At 25 per cent load, each pound of steam leaving the engine carried with it 85 lb. of water. At 100 per cent load, each pound of steam carried 18 lb. of water, while at the maximum loading of 117 per cent, 13 lb. of water was carried out by each pound of steam. Better streamlining of the engine jackets would increase the amount of water circulated per pound of steam at all conditions of loading.

The above figures parallel very closely the circulation, percentagewise, in a water-tube boiler. It also shows the impossibility of insufficient cooling water being brought into the engine at any loading.

Actual Field Tests

A 6-cylinder, 605-cu.-in., 4-cycle engine pulling a triplex pump was selected as the guinea pig for field tests. This engine operates normally on the A.P.I. curve with a piston speed of 1,000 ft. per minute.

A steam separator was installed so it could be raised and lowered, enabling variation of the heads on both legs. At various points in the cooling system where changes of pressure might occur, holes were drilled and tapped. Cocks were installed to take pressure readings.

Since temperatures above the atmospheric boiling point are determined by system pressure, no thermometer wells were installed other than in intake and discharge lines. Temperatures within the jackets were obtained from the steam table. To insure greater accuracy, mercury manometers were used instead of spring pressure gages; pyrex nipples were installed on intake and discharge lines.

A series of studies was then started, using the engine pump to circulate the coolant. Curves showing pressure drops throughout the system were developed under various heads, volumes, and velocity conditions.

Studies of this machine were continued over a total period of several months. Curves were plotted under many conditions. At one time, by use of an oil barrel for a reservoir, a minus zero intake head was achieved. At another time the engine was operated for 3 days, pulling a 40-b.hp. load while using ¼-in. copper tube for a water intake line.

Low temperature rise . . . During this time, temperature rise of coolant across the engine was reduced to 1° F. On a similar engine but using an improved piping system, we were able, at a later date, to get a temperature rise of less than ½° F. This low temperature rise was obtained only when the cooling system was properly designed, as shown in Fig. 3.

• **The steam separator** should be placed as near the engine as possible.

Entrance into the separator should be approximately on a level with engine coolant outlet. An ample line should

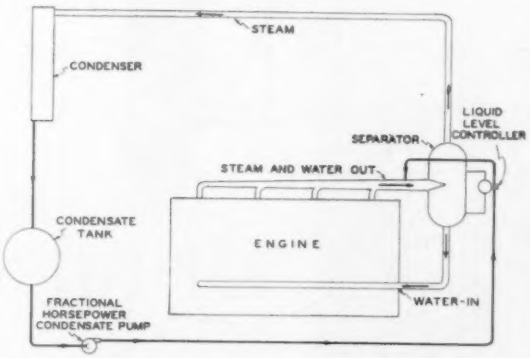


Fig. 3—Schematic arrangement of a properly designed system.

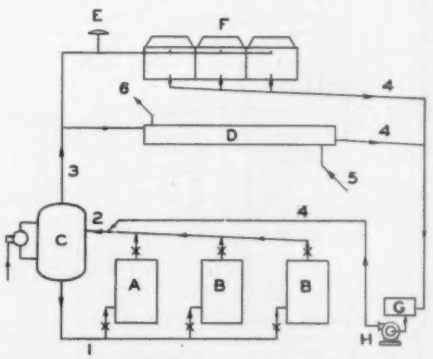


Fig. 4—Multiple-engine installation.

connect them to prevent unnecessary pressure buildup within the engine jackets.

• **A small water line** from the separator to the bottom of the engine is essential. The small line reduces radiation losses and temperature rise across the engine.

• **Return condensate** to steam line leaving engine instead of to water line entering engine. Since the condensate may return quite cool, admitting it on intake side of engine would tend to cool the entering jacket water and create increased rise across the engine. The condensate, if admitted to the steam and water line leaving the engine, will pick up heat from the steam without affecting temperature of the mixture.

A multiple-engine installation is shown in Fig. 4. Results of tests on this engine are shown in Fig. 5.

Compressor Engine Testing

A gas-engine-driven compressor on a similar cooling system was next tested. This was a 4-cycle, 4-cylinder 11 by 12-in. engine developing 150 b.hp. at 4.5 in. manifold mercury depression and 350 r.p.m. Whereas the original test engine had been set to operate at, or slightly above, atmospheric pressure, the "separation unit" on the compressor was set to hold a pressure of 10 psi. (or 240° F.) on the engine jackets.

Pyrex glass windows were installed in a cylinder jacket wall, top and bottom over valve ports; in the head at four locations; in exhaust manifold cooling jacket; and pyrex nipples in intake and discharge coolant lines. The water pump being also bypassed.

Since this compressor is used on well-startup service, it is subject to load changes from light to maximum overload at very frequent intervals. This has enabled the study and photographing of boiling phenomena under all kinds of loads and speeds. Evaluation of observed phenomena was the really difficult part of these operations.

Test results on pressure drops and temperatures are shown in Fig. 6.

Results obtained . . . One of the most important factors in this type of operation is cylinder-liner temperature under boiling conditions. Liner temperatures have been plotted against coolant in both high and low-temperature direct transfer cooling but not under boiling transfer. Such study would probably show the cylinder liner to be little (if any) hotter, straighter, and more round than under normal cooling. This would explain the reason we are getting more power and smoother operation in our engines cooled by boiling.

• **The interfacial heat transfer** from a metal to a liquid under boiling conditions is many times faster than under direct heat transfer. This greater speed of heat transfer leads to the very reasonable assumption that metal temperatures are lowered substantially.

Regardless of the metal temperature during growth of a steam bubble, upon separation of the bubble from the metal, the metal cannot be rewet until it has locally dropped to the temperature of evaporation at existing pressures.

• **Visual observations** and cylinder-jacket photos have shown established boiling over the full length of the liner. It is thus concluded that such liner temperature is uniform and comparatively low along its entire axis.

A slight change in upper and lower cylinder-wall temperature will be found due to varying differentials between wall temperatures and superheat of water at different cylinder positions. The amount of this variation could be shown by applying the heat-transfer equation at varying cylinder elevations to determine the temperature difference, $(t_l - T_{sat})$, where t_l is inner liner temperature and T_{sat} is the saturation temperature of the liquid at existing pressure.

A similar temperature condition will exist along the entire cylinder length when full boiling is established, since no bubble can be formed until the liquid film adjacent to the liner wall has been superheated to a point above the saturation temperature. With boiling along the entire cylinder liner, such as is observed under full load, a uniformly true cylinder is maintained.

Under very light load, or with poor piping, boiling at the bottom would not occur. In that event these conclusions would not be entirely true.

Low liner temperatures . . . Under boiling heat transfer liner temperatures are thought to be normal at all times.

Several things which strengthen this belief have been noted in engines during ebullient cooling:

1. In extremely elevated boiling temperatures up to 270° F., no detonating or loss of power occurred.

2. Crankcase temperatures remain normal at around 180° F.

Furthermore, the crankcase tempera-

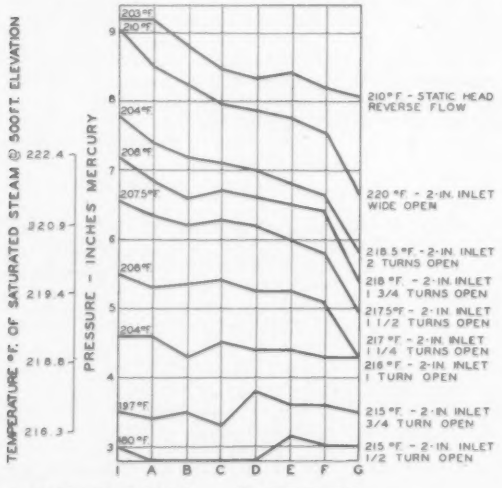
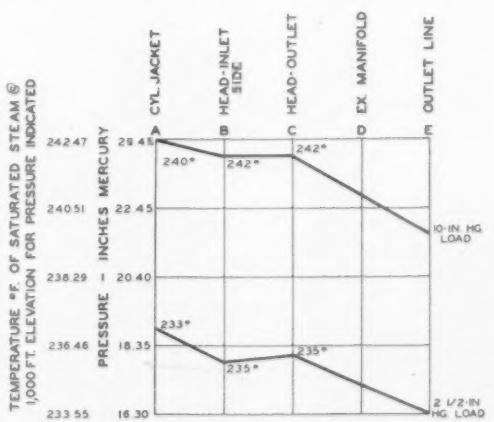
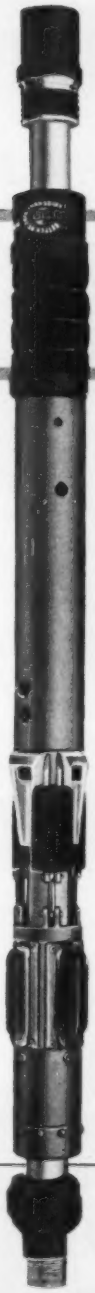

TEMPERATURE °F. OF SATURATED STEAM @ 500 FT. ELEVATION
PRESSURE - INCHES MERCURY
222.4
220.9
219.4
218.8
216.3
203°F
210°F
204°F
206°F
207.5°F
206°F
204°F
197°F
180°F
9
8
7
6
5
4
3
210° F. - STATIC HEAD REVERSE FLOW
220 °F. - 2-IN. INLET WIDE OPEN
218.5 °F. - 2-IN. INLET 2 TURNS OPEN
218 °F. - 2-IN. INLET 1 3/4 TURNS OPEN
217.5°F - 2-IN. INLET 1 1/2 TURNS OPEN
217 °F. - 2-IN. INLET 1 1/4 TURNS OPEN
216 °F. - 2-IN. INLET 1 TURN OPEN
215 °F. - 2-IN. INLET 3/4 TURN OPEN
215 °F. - 2-IN. INLET 1/2 TURN OPEN
I A B C D E F G
I - INLET LINE TO ENGINE
A - TOP OF CYLINDER JACKET
B - BOTTOM OF END OF HEAD
C - TOP OF END OF HEAD
D - TOP OF HEAD
E - HEAD TO EXHAUST MANIFOLD
F - TOP OF EXHAUST MANIFOLD
G - LINE TO SEPARATOR UNIT

Fig. 5—(Left) Results of tests on hookup shown in Fig. 4.

Fig. 6—(Below) Test results on pressure drops and temperatures.





This is a

QUALITY

PRODUCTION PACKER

- Type "LC8" with 8″ valve stroke is Guiberson's finest production packer. Combining the best and most desirable packer features, it is quality designed and manufactured to perform faultlessly in deep wells—even when subjected to high differential pressures or other difficult well conditions.

- Long-wearing friction pads furnish positive "back-ups" for the all-metal latch, which releases easily yet latches automatically when tubing is picked up.

- One-piece packing rubber of positive-seal design is molded from special resilient, oil-resistant compound. Valve seat is lifted away from the packing element when packer is pulled, allowing space for full rubber retraction. Ample clearance within the packer assures satisfactory performance in heavy muds.

- Type "LC30" with 30″ valve travel is also available and either type may be purchased with perforated mandrel on special order.

TYPE "LC8"

GUIBERSON

CORPORATION

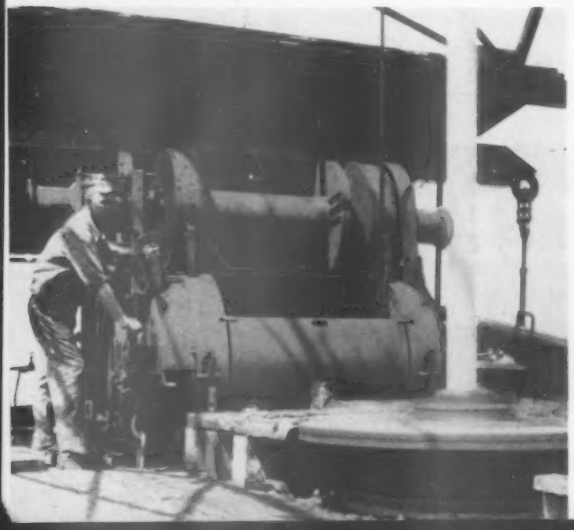
ESTABLISHED 1919 - DALLAS, TEXAS, U. S. A.

Sold By Leading Oil Field Supply Stores Everywhere

the

Model R with beam. Rotary assembly can be attached at same time.

Rotary drilling with 4½ inch drill pipe to 4,859 feet in Oklahoma.

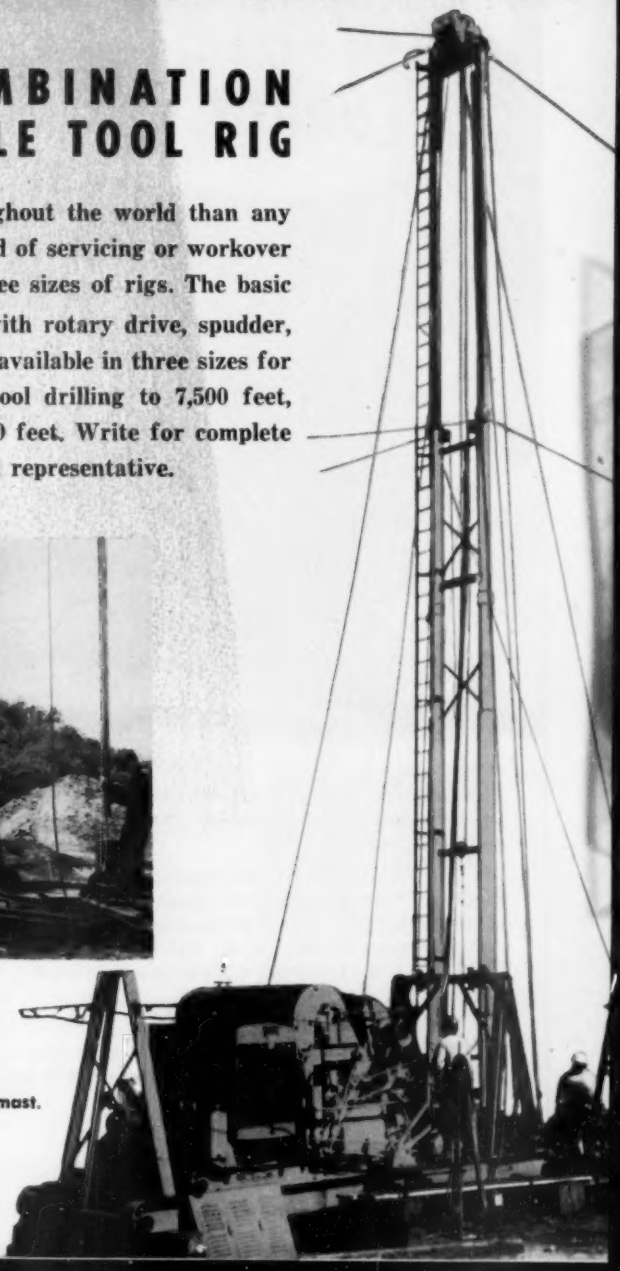


Workhorse of the Oil Fields

CARDWELL COMBINATION ROTARY OR CABLE TOOL RIG

More of these rigs are in use throughout the world than any other model of drilling rig. Every kind of servicing or workover job is now being done with these three sizes of rigs. The basic double drum hoist can be equipped with rotary drive, spudder, third drum, or beam assembly, and is available in three sizes for rotary drilling to 5,000 feet, cable tool drilling to 7,500 feet, servicing and workover jobs to 10,000 feet. Write for complete catalog, or see your nearest Cardwell representative.

Double drum with spudder on drilling-in job.



Three-drum rig with spudder and 65-foot mast.

CARDWELL

REG. U. S. TRADE MARK PAT. OFFICE

THIS TRADE MARK INSURES HIGHEST QUALITY AT LOWEST PRICE

CARDWELL MFG. CO. INC.

P. O. Drawer 2001 . . . Long Distance Telephones 128—129—130

Cable Address: "ALL STEEL," Wichita — "CARDSTEEL," New York

Wichita, Kansas, U. S. A.

THERE IS A CARDWELL PARTS STOCK NEAR OR IN EVERY OIL FIELD OF THE WORLD.

Regardless of climatic conditions—in hot or cold weather—Lorain Engines give you easy-starting, low-cost pumping power on gas or diesel fuel.

Their day-in and day-out dependability and lower maintenance cost is based upon sound, rugged design and precision construction. Hefty roller bearings throughout, thermo-syphon cooling, removable wet cylinder liner—means Lorain Multi-Fuel Engines take the toughest pumping jobs in stride.

Ranging from 20 to 60 horsepower, there's a Lorain Engine to fit *your* pumping job. Just contact your nearest Oilwell Supply man for full details on Lorain Engines—the engines designed for heavy duty service. You can't beat them for keeping pumping cost low.

A-6810

Distributed by

OIL WELL SUPPLY COMPANY
BRANCHES SERVING ALL DOMESTIC OIL FIELDS
***EXPORT:* 30 Rockefeller Plaza, New York 20, N. Y.**

WHITE-ROTH

ture does not appear to be affected either by engine-coolant temperature or engine loading but is affected by ambient air temperature. As a result, all oil coolers have been removed from engines cooled by boiling heat transfer. This has been possible because all these engines are of the dry piston type. With oil-cooled pistons, it would be necessary to cool the oil. Cooling of oil would, of course, be from some source other than the engine coolant.

In low-temperature compressor engines a load limit near to the manufacturer's rating is maintained. On compressors operating under boiling phenomena, the limits have been removed, loading being left to the discretion of the plant operators. As a result, the operators are now loading these engines up to 117 per cent of their rated horsepower.

A loading of 110 per cent is considered safe and economical for 24-hour per day operation.

Economics of Cooling by Boiling

The value of any new method of operation should be measured in terms of cost, changes in efficiency, operating cost, and life of equipment. This last cannot be evaluated at this time.

First cost is favorable when cooling by ebullition is compared with low-temperature cooling. On certain installations the first cost may be as much as 35 per cent under conventional methods. In no stationary equipment should the costs be greater, and when compared with high temperature direct heat transfer cooling, the first costs will be about the same.

Saving in operating costs is considerable when cooling by ebullition as compared with cooling towers and radiator maintenance and operation. Cleaner engines, top and bottom, and less carbon deposit are other achievements.

An increase in thermal efficiency of around 40 per cent is noted. This increase is in the form of waste-heat-recovered steam from compressors which is currently being used in heating crude oil preparatory to dehydration. Steam from pumps is being used to heat power oil and thereby reduces waxing in the pipe lines.

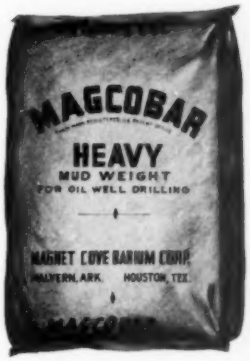
Each such installation has resulted in a partial or complete elimination of a boiler plant or direct fired heater. As a result, the number of engines cooled by ebullition on our leases will be increased in 1953.

In view of the limited amount of data available regarding boiling phenomena, it is only reasonable to suppose that parts of these conclusions may be subject to revision. A careful and accurate study of engine-liner temperature under boiling heat transfer would probably be of more value than any one other thing.

For A "Mixture" That Makes For Easier, Safer Drilling

Any man who enjoys a good pipe will tell you . . . quality tobaccos, properly mixed, are mighty important to smoking perfection. And mighty important to safe, economical drilling operations is the application of the proper drilling fluid mixtures such as those stocked by your Magcobar Dealer.

Magcobar, for example, is the highest quality barite you can buy. Because of its purity and correct particle size it produces heavy drilling muds of low viscosity . . . muds that are easier and less costly to control. Magcobar quality is the result of constant laboratory research and carefully controlled processing. So, for safer, more economical drilling . . . put Magcobar in your drill pipe . . . and circulate it. There are more than 375 Magcobar Dealers ready to service you night and day.



Our Name is Mud!

Magcobar
Complete
DRILLING MUD SERVICE
DEALER

MAGNET COVE BARIUM CORPORATION

ONE OF THE DRESSER INDUSTRIES

HOUSTON, TEXAS

MAGCOBAR • MAGCOGEL • HIGH YIELD • XACT CLAY • SALT GEL • MY-LO-JEL
MY-LO-JEL PRESERVATIVE • DRISCOSE • FORMAPLUG • CELL-O-SEAL • FIBER SEAL
MAGCO FIBER • LEATHER-FLOC • MAGCO MICA • JEL-OIL MUD • JEL-OIL "E"
"E" CONCENTRATE • NOHEEV • TANNATHIN • RED OX LIQUID • ALKATAN
QUEBRACHO • KEMBREAK • MAGCOPHOS • CHEMICALS

KOBE

IS ONE OF THE DRESSER INDUSTRIES

An important member of the family of Dresser Industries since 1945, Kobe Inc. Division of Dresser Equipment Co., of Huntington Park, California, today plays a vital role in reducing operating costs for oil producers everywhere. Kobe's hydraulic oil well pumping system, featuring the famous Free Pump, has revolutionized production techniques with resultant savings on labor and equipment costs.

Magnet Cove Barium Corp., *Houston, Tex., Malvern, Ark., Greybull, Wyo.* Magcobar drilling mud, Magcogel bentonite, Mylojel, Fiber Seal, Jel-Oil mud.

Clark Bros. Co. Division, *Olean, New York.* Engines and compressors—gas, steam and diesel driven.

Dresser Manufacturing Division, *Bradford, Pa.* Oil and gas and pipe couplings, fittings and sleeves—rolled and welded rings—welding fittings and flanges.

Kobe, Inc., Division, *Huntington Park, Calif.* Complete hydraulic oil field pumping systems, including the Kobe Free Pump.

What is DRESSER INDUSTRIES

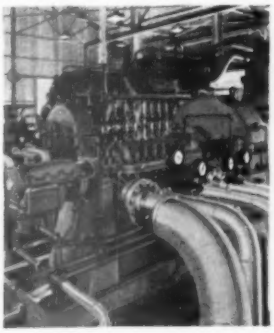
Dresser Industries, Inc. is one company—with the strength of many! A joint endeavor dedicated to producing the finest of integrated equipment and coordinated service for the oil, gas and chemical industries.

Each member company is an individual specialist and leader in its field. The parent, Dresser, incorporates many added services into its over-all administration, yet each company retains its individual identity and management. Such an integrated organization derives economies that are passed on to the operator along with the many other advantages of the specialized experience, know-how, research and development of each of these operating companies.

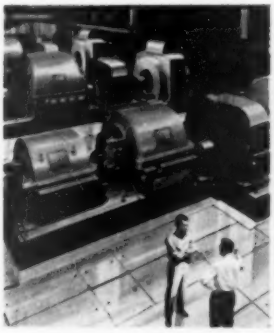
Dresser Industries is a vigorous, competent, far-reaching team to help meet efficiently the world's ever expanding energy requirements—a service unlimited—that makes your job easier, faster, more productive. This is your dividend from these combined operations—the DRESSER PLUS +

Kobe's Free Pump, adapted from the original hydraulic pumping system, hydraulically "runs" and "pulls" the bottom hole pump, allowing pumper to handle pump changes without service crews or equipment required by other pumping methods. The advantages due to operating and installation cost savings are further amplified by many extra features which include positive paraffin control, easy and quick bottom hole pressure surveys and wide-range well regulation.

DRESSER INDUSTRIES, INC.
OIL, GAS AND CHEMICAL EQUIPMENT
ATLANTIC BUILDING ★ DALLAS, TEXAS



Pacific Pumps, Inc., *Huntington Park, Calif.* Centrifugal pumps, deep oilwell plunger pumps, hot oil and boiler feed pumps.



Roots-Connersville Blower Division, *Connersville, Ind.* Rotary positive blowers, gas pumps; centrifugal blowers, exhausters; positive displacement meters.

Security Engineering Division, *Whittier, Calif., Dallas, Tex.* Rock bits, reamers, casing scrapers, reamer rock bits, coring bits, Securaloy.

Ideco Division, *Dallas, Beaumont, Tex., Torrance, Calif.* Derricks, drawworks, rambler drilling rigs, traveling blocks, rotary tables.

LEADERS

in World Oilfields...

Every Security product embodies the manufacturing skill and craftsmanship acquired through two decades of manufacturing know-how. In design, in engineering, in performance, Security drilling equipment is unsurpassed.

That's why Security Rock Bits—Reamers—Hole Openers—Casing Scrapers—Securaloy—are leaders in world oil fields.

Get Security in *your* drilling now.

GET **Security** IN DRILLING

SECURITY ENGINEERING DIVISION

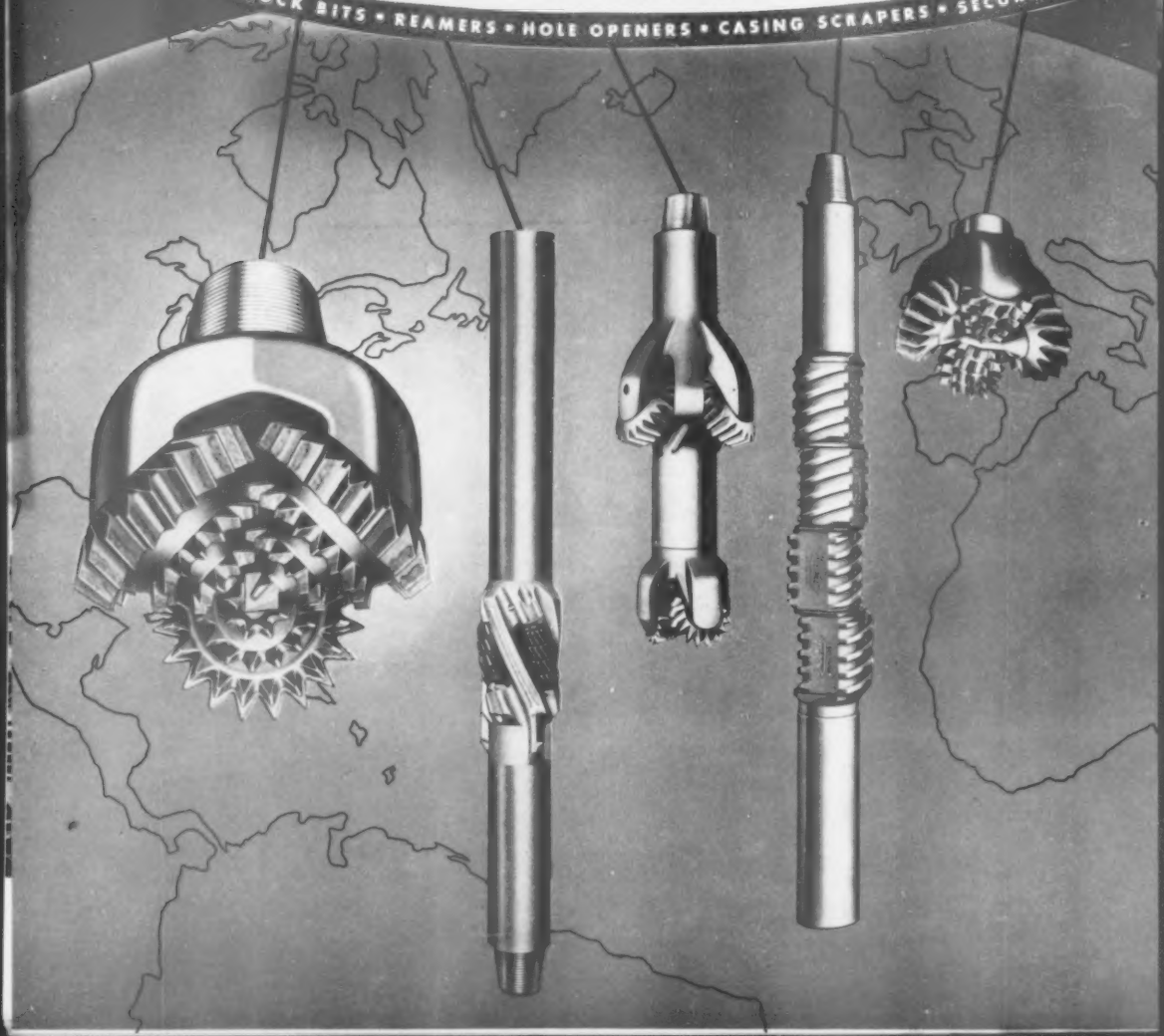
DRESSER OPERATIONS, INC. 53-4C-P3

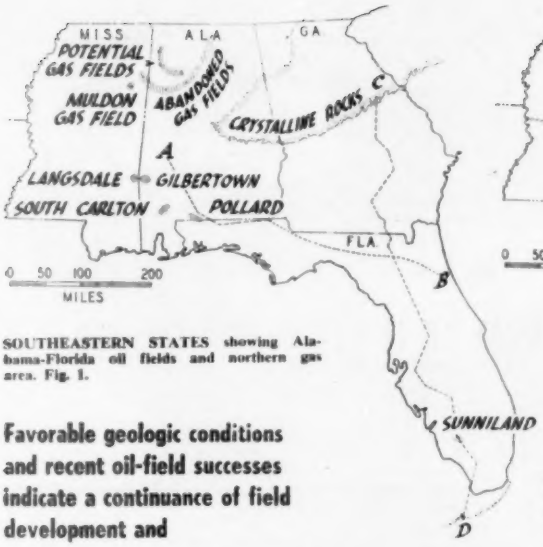
Main Office: Whittier, Calif.—*Export:* Chanin Bldg. N.Y.C.

Plants: Whittier, Calif.—Dallas, Texas

Branches in all major producing areas

ROCK BITS • REAMERS • HOLE OPENERS • CASING SCRAPERS • SECURALOY





SOUTHEASTERN STATES showing Alabama-Florida oil fields and northern gas area. Fig. 1.

STATE	FAVORABLE AREA ESTIMATED (SQUARE MILES)	VOLUME OF SEDIMENTS ESTIMATED (CUBIC MILES)
ALABAMA (SOUTH) (NORTHWEST)	33,000 18,000 15,000	50,000 - 80,000
GEORGIA	23,000	10,000 - 20,000
FLORIDA	55,000	120,000
MISSISSIPPI	47,000	140,000

POTENTIAL PETROLEUM PROVINCES in the Southeastern states are shown here. Fig. 2.

Favorable geologic conditions and recent oil-field successes indicate a continuance of field development and

Exploration Activity in the Southeastern States

by Robert B. Baum

THE discovery of Pollard oil field in southern Alabama early in 1952 sparked a campaign of leasing and exploration which spread quickly into Georgia and Florida.

At the present time geophysical exploration of the area is accelerating appreciably, especially with the seismograph. Unlike most other favorable sedimentary provinces, thorough testing of the seismic method in Alabama, Georgia, and Florida is just beginning. The reason the method was not used extensively until recently probably lies in its past failure to provide satisfactory and consistent reflection records. In recent months, however, improvements in instrumental and interpretive techniques have been achieved through experimental work.

Area's Oil Fields

The oil fields of Alabama and Florida and the northern gas area of Mississippi and Alabama are located on Fig. 1.

In the northern area is a belt of four abandoned and three potential gas fields. At the present time the only production in this northern province is being obtained from the recently discovered Muldon gas field which lies in the Mississippi portion of the area. This discovery spurred leasing and geophysical activity and many seismic parties currently are conducting surveys throughout the area.

Southwestern Alabama boasts three oil fields: Gilbertown, South Carlton, and Pollard. Mississippi's Langsdale field was extended into Alabama in 1951 by the completion of a producing well across the state line, but this field is considered primarily a Mississippi development.

The only other production in the area is obtained from Sunniland field located in the southern part of the Florida Peninsula. Except for Sunniland, the vast area lying east and south of southwestern Alabama is barren of commercial production.

Future Provinces

The potential petroleum provinces of the region as outlined by the American Association of Petroleum Geologists in 1941 and 1951 are shown in Fig. 2.

The map indicates the northwestern part of Alabama as favorable for possibilities from Paleozoic beds, while the entire area of Mississippi and Florida and most of the southern portions of Alabama and Georgia appear favorably situated with respect to potential production from younger beds.

The table at the bottom of Fig. 2 shows the area favorable for possible production and indicates the estimated volume of sedimentary deposits underlying these areas. The size of the area comprising the southeastern states (including Mississippi) compares favorably with the size of the State of Texas.

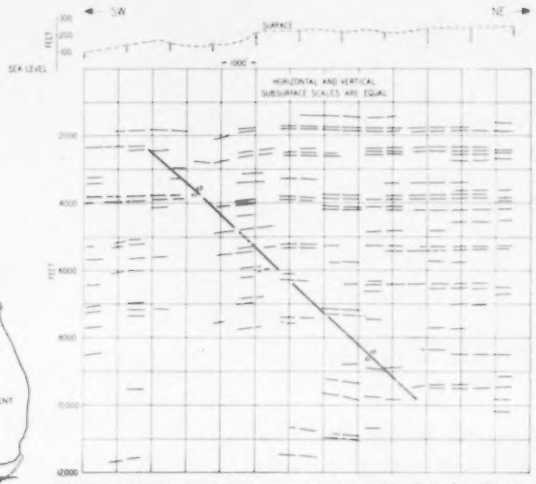
General Geology

The regional dip in southern Alabama, in general, is south-southwestward, interrupted by the Hatchetigbee anticline and the north-south-trending Jackson fault. The northern part of Georgia is blanketed by Paleozoic and crystalline rocks, the south part showing south-to-southeast regional dip. In general, the regional dip in Florida is southward, modified by the feature in the northern part of the peninsula known as the Ocala uplift, the southern flank of which develops into the South Florida embayment.

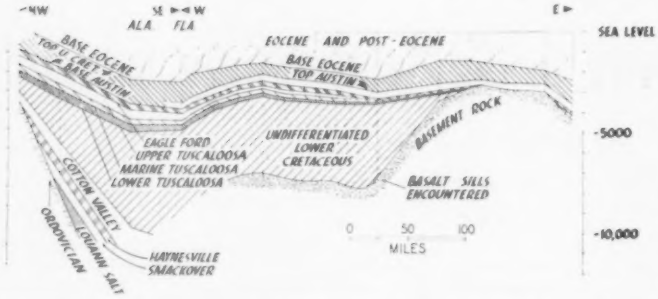
The approximate outline of the basin-type areas within this region and the associated areas of uplift are shown in Fig. 3. A basin, described as the Suwanee Strait and believed to result from an erosional feature subsequently filled in by Tertiary beds, is depicted as connecting the Southwest and Southeast Georgia basins. Evidence support-

*This article is a condensation of a paper presented at the sixth annual midwestern meeting of Society of Exploration Geophysicists, Fort Worth, November 1952. The entire paper will be published in the April 1953 issue of Geophysics, S.E.G.'s quarterly journal of general and applied geophysics.

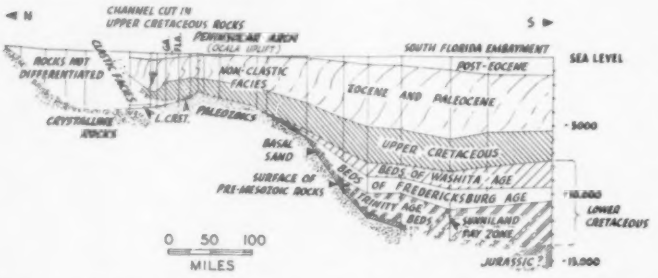
BASIN AREAS and associated features are shown here in approximate outline. Fig. 3.



SEISMIC CROSS-SECTION across Pollard field, Escambia County, Alabama. Fig. 6.



STRUCTURAL CROSS-SECTION of Marengo County, Alabama, to Flagler County, Florida, based on 18 wells. Fig. 4.



STRUCTURAL CROSS-SECTION from outcrop of crystalline rocks in Central Georgia to Big Pine Key, Monroe County, Florida, based on 22 wells (After Florida Geological Survey). Fig. 5.

ing the opinion that the basin is erosional in nature is found by the absence of beds of the Upper Cretaceous Navarro and Taylor formations. The Central Mississippi "ridge" appears to be a zone of regional terracing which separates the Black Warrior and Mississippi salt basins.

Cross-sections . . . A profile based on 18 wells is shown by Fig. 4 (line A-B on Fig. 1). Jurassic and Ordovician beds are reached only in wells at the northwestern part of the profile, with basement rock encountered underlying the Cretaceous east of the Central Florida Panhandle. The large regional unconformity known to be present at the base of the Upper Cretaceous in southern Alabama is apparent on the cross-section.

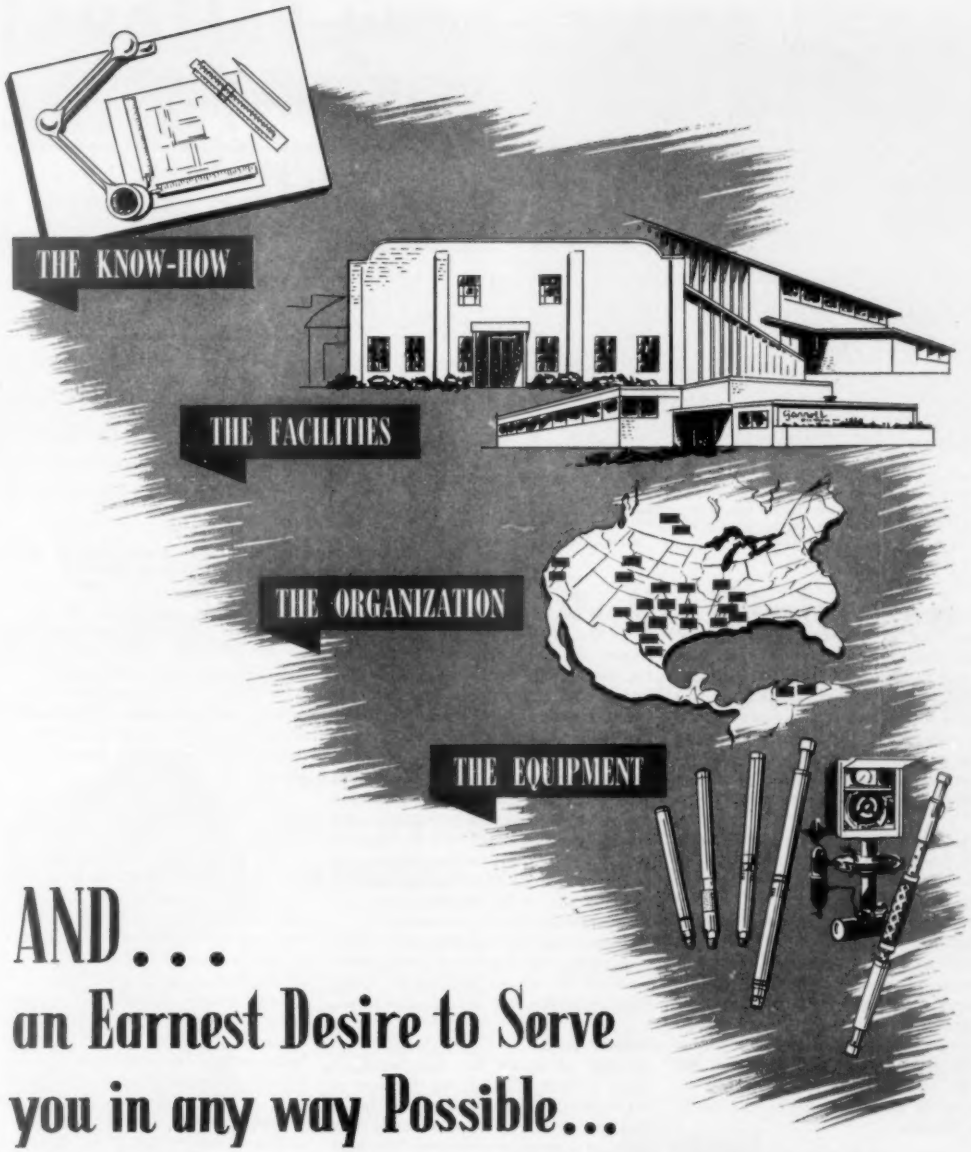
Actually, Upper Cretaceous beds rest on igneous or Paleozoic rocks in Central Alabama. Farther downdip the Lower Cretaceous formations wedge in and probably rest on igneous and Paleozoic rocks also. A rather thick Cretaceous section with apparently favorable development of the Tuscaloosa zone is observed in the southern Alabama-northwestern Florida area. A thick Cretaceous section is also shown to develop west of the Ocala uplift with beds of pre-Austin age appearing to wedge out on both flanks of the feature.

The north-south cross-section, Fig. 5 (line C-D on Fig. 1) is taken from the 1952 Florida Geological Survey guidebook. The erosional feature on the north flank of the Ocala uplift described earlier is indicated in cross-section as a channel cut in Upper Cretaceous rocks. Clastic facies appear to

THE AUTHOR

ROBERT B. BAUM

Robert B. Baum is Seismograph Service Corp.'s district manager in Shreveport, La. He obtained a B.S. degree in geology from University of Chicago in 1941 and has been engaged in geophysical exploration with S.S.C. since that time. His seismic experience includes work offshore Canada, offshore East Coast, in Illinois-Indiana, the Mid-Continent area, West Texas, and the Gulf Coast.



AND...
an Earnest Desire to Serve you in any way Possible...

Your Garrett representative is always ready to place his services, or the entire facilities of his company, at your disposal. You are urged to call whenever you feel that we may be of assistance.

"Let us design your next gas lift installation."

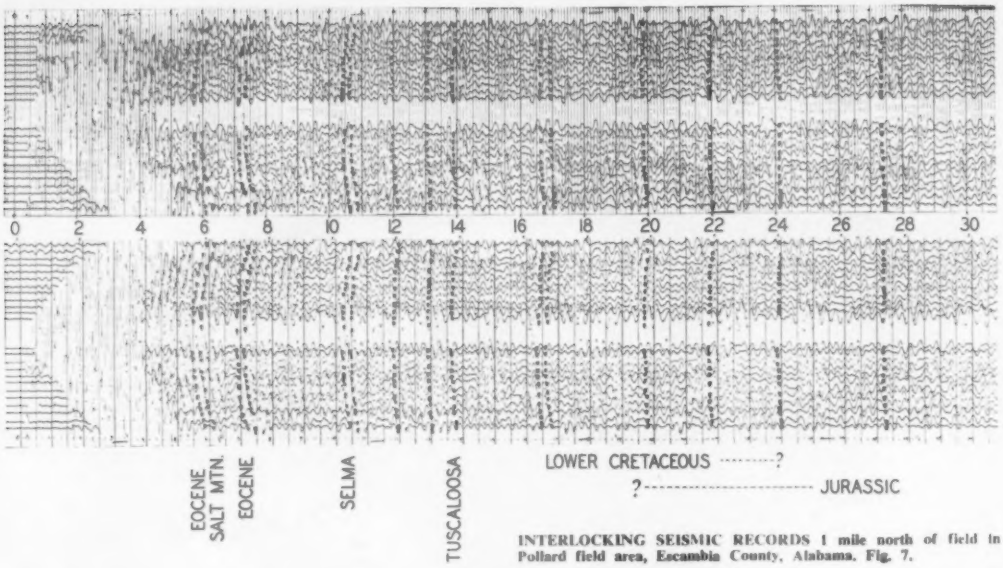
HOUSTON
ABILENE
ALICE
BEAUMONT
CORPUS CHRISTI
LONGVIEW
ODESSA
TYLER
VICTORIA
HARVEY
HOUMA
JENNINGS
LAFAYETTE
NEW ORLEANS
SHREVEPORT
HOBBS
PUERTA LA CRUZ
OKLAHOMA CITY
LOS ANGELES
BAKERSFIELD
STERLING
CASPER
CALGARY
EDMONTON
MARACAIBO

got

Garrett Oil Tools, Inc.

P. O. BOX 6115 HOUSTON 6, TEXAS

Manufacturers and distributors of the world's most complete line of gas lift valves



INTERLOCKING SEISMIC RECORDS 1 mile north of field in Pollard field area, Escambia County, Alabama. Fig. 7.

predominate north of the uplift and nonclastics to the south, with marine sediments ranging from 50 per cent in the north to almost 100 per cent in the south. A thick Cretaceous section is shown to develop downdip into the embayment. The Upper Cretaceous beds overlap all the older formations from south to north and locally rest on metamorphic rocks in the north.

Zone of interest . . . Principal exploration interest in southern Alabama and northwestern Florida at the present time is centered in the lower part of the Upper Cretaceous beds, a zone which is a rich producer of oil in East Texas and North Louisiana. This formation is identified as the familiar Woodbine in northeastern Texas and is correlated as the time rock equivalent of the middle and lower Tuscaloosa of Mississippi and Alabama, and of the middle and lower Atkinson formation of southern Georgia and northern Florida.

Geophysical Approach

Since sufficiently thick sections of favorable reservoir rocks are indicated to underlie most of the area (Figs. 4 and 5) it is inferred that the failure to find more than four oil fields in Alabama, Georgia, and Florida lies in the absence of the usable tool for locating structural traps.

All four of the oil fields found thus far are controlled by structural traps of the type commonly sought by the reflection seismic method, but safisfactory results obtained from its use in past years were seldom reported.

At the present time refraction techniques are being employed throughout the land areas of Florida and in its waters along the western coast by various companies. Results are considered favorable.

Recent efforts by some oil companies and seismic contractors have also indicated encouraging reflection results. It was recognized that considerable experimenting and research would be necessary before satisfactory reflection data could be obtained. While much is still to be desired in this respect, substantial improvement in instrumentation, field procedures, and interpretative techniques have been achieved in certain areas from operations of production and research crews.

Pollard profile . . . A seismic cross-section, presented by permission of Gulf Refining Co., shows the dips of subsurface reflections obtained from a traverse extending approximately 2½ miles in a northeast-southwest direction across Pollard field (Fig. 6). The bearing of the traverse is normal to the strike of the major fault indicated by the well data. The fault is shown on the cross-section as determined by data from the well across which the seismic profile was surveyed. The dips shown were computed by continuous profile methods. Individual depth points were plotted for each of the geophone stations lying between the shot points occupied. Sufficient reflection data are evident on the cross-section to indicate the existence of faulting. Selma chalk reflections are correlated on opposite sides of the fault at depths approximating 4,000 ft. Anomalous dips are noted in the major fault zone.

An example of representative seismic records in the vicinity of Pollard field is shown in Fig. 7. It is evident that usable and correlatable seismic events are present.

Much of the difficulty in obtaining good quality reflection data is attributed to near-surface conditions such as the presence of the Citronelle formation which blankets much of southern Alabama and northwestern Florida, and the limestone outcrops farther east and south in Florida. Seismic reception is also affected adversely by erratic changes in weathering and elevation, and in many instances better-quality reflection records appear to be obtained in areas of low elevation. Some success has been reported on the Florida Peninsula with the use of multiple geophone and multiple shot-hole patterns.

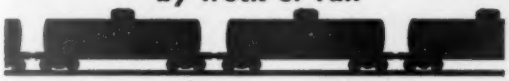
The success of future seismic efforts for the area is believed to depend on continued experimenting with consideration of the influence of the mantle rocks and other near-surface effects.

Acknowledgments

The cooperation from my friends with Gulf Refining Co., Carter Oil Co., and Seismograph Service Corp., and the generosity of these companies in releasing pertinent information, have made the presentation of this material possible. The assistance given by B. W. Blanpied, among many others who contributed substantially, is sincerely appreciated. The preparation of the illustrations was supervised by C. L. Bury, of Seismograph Service Corp.

FRONTIER delivers

by truck or rail



WHERE AND WHEN
YOU WANT IT

* caustic soda (FLAKE, SOLID, LIQUID)	* chlorine
* muriatic acid	* oil well and industrial salt

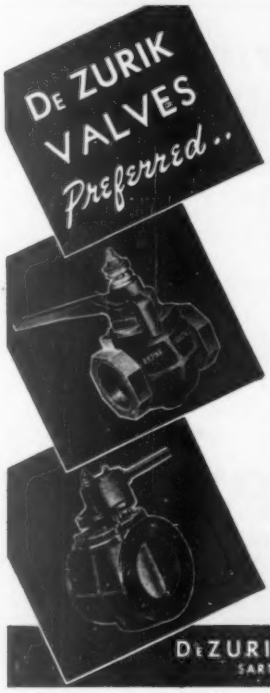
ANYWHERE IN THE ROCKY MOUNTAIN, MID-CONTINENT AND SOUTHWEST AREAS

Frontier Chemical Company
ELECTRO-CHEMICAL MANUFACTURERS

GEARED TO SERVE THE OIL INDUSTRY

GENERAL OFFICES
321 WEST DOUGLAS
WICHITA, KANSAS
PHONE 7-5215

Wichita, Kansas • Denver City, Texas • Midland, Texas • Denver, Colorado



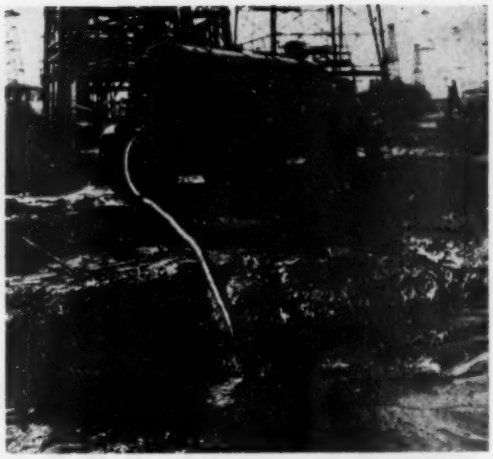
For OIL WELL SALT WATER HANDLING

A LEADING PRODUCER REPORTS: "After two years of testing DeZurik acid-resisting bronze valves with rubber-faced plugs on salt-water disposal systems, we have standardized on them for this service."

Salt-water handling is just ONE oil industry service where DeZURIK VALVES are setting new standards in trouble-free, leak-free performance. Other applications include storage-tank lines, gas lines, loading racks, catalyst systems, etc.

DeZurik Valves with rubber-faced plugs can't bind, won't gum up, are 100% friction-free, operate with an easy quarter-turn. Write for details.

DEZURIK SHOWER CO.
SARTELL, MINNESOTA



See how this self-contained Thompson Unitized Vacuum Tank unit comes right in where the work is to be done? One man handles the complete operation and drives the truck. Fast loading and quick emptying are assured by Thompson's exclusive pressure-vacuum feature.

Pulls Right Up to Any Job!

THOMPSON UNITIZED VACUUM TANKS can pull in wherever liquids or semi-solds are to be loaded or unloaded. That's one reason why these self-contained units give top performance on a dozen essential oil industry jobs. Oil men say that Thompson Vacuum Tanks are the cleanest, fastest *(up to 50% faster!)*, lowest cost way to clean tanks and cooling tower basins; empty sumps and cellars; transport drilling mud, acids, sludge, brine, waste crude; spray weeds and roads.

EXCLUSIVE VACUUM-PRESSURE FEATURE permits operator to use either at the turn of a valve. As no part of the load—nothing but air—passes through the pump, abrasive action is eliminated and wear is minimized.

20 TO 100 BBL. CAPACITIES cover every job requirement. Thompson Unitized Vacuum Tanks can be mounted on trucks, trailers, semi-trailers or skids, and standard attachments (spray bars, hose reels, etc.) are available for all types of jobs. Your request will bring complete information about "the handiest tool in the oil industry."

See Our Exhibit
OIL SHOW
TULSA
MAY 14-23, 1953

SOLE LICENSEE TO MANUFACTURE VACUUM TANKS UNDER U.S. PATENT NO. 2522077

THOMPSON TANK & MANUFACTURING CO. INC.

2019 E. Wardlow Road
Long Beach 7, California

FOR FAST, DEPENDABLE SERVICE ON OIL FIELD EQUIPMENT AND SUPPLIES

Whatever your needs are in oilfield supplies
There's one place to get them without useless tries,
Just contact the nearest of our numerous stores
For—midday or midnight—we ne'er "close our doors."

From rig tip to drill bit, betwixt and between,
We carry each item of which drillers dream,
And when down-time's your headache just give us a try;
When Speed can mean Dollars It's "UNITED SUPPLY."

Uncle Sandy Says: *There's more truth than poetry in this!*

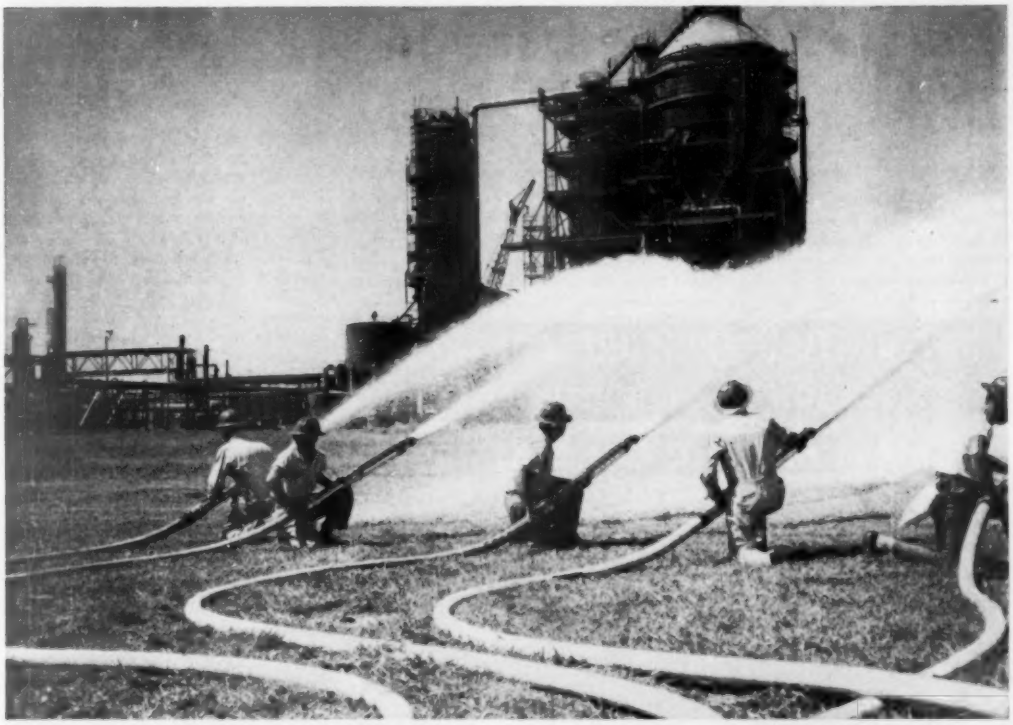
COURTESY • SERVICE • DEPENDABILITY

YOU CAN RELY ON UNITED SUPPLY!
UNITED SUPPLY

UNITED SUPPLY

AND *Manufacturing* COMPANY
TULSA, OKLAHOMA

Stores In: KANSAS, OKLAHOMA, TEXAS, LOUISIANA AND NEW MEXICO



Foam for use in fighting refinery fires is . . .

. . . sped to scene by specially equipped trucks

By F. Lawrence Resen

A FOAM house on wheels has been put into operation at Shell Oil Co.'s Houston refinery.

The portable unit can rapidly travel to any section of the 1,200-acre plant area and use its foam in the extinguishing of any fire which might occur.

With 400 storage tanks as well as extensive units located within the refinery limits, the versatility of the unit in being able to travel to the scene of any blaze goes without saying.

The new unit consists of two trucks and a trailer drawn by one of the trucks. The trailer has its share of supporting equipment along with a 900-gal. storage tank for the foam.

Units at work . . . In operation, the fire crews rush with trucks and trailer to the scene of the fire. One unit is spotted close to the nearest of the water hydrants that are strategically located throughout the refinery.

After a hose is connected and water is flowing through the truck to the foam chambers, the operator adjusts a special proportioning pump to inject the foam liquid into the water stream at the proper rate.

The resulting stream coming out of the hose nozzle is the fire-quenching foam, which is played upon the blaze. Throughout the operation, special flow meters provide a continuous check on the correct input of foam liquid and water flow.

The foam house carries all of the necessary chemicals and pumps required and minimizes the length of pipe required for making foam available at the scene of a fire.

Portable Heater Used in Tank Cleaning at Rangely

R. W. Grisdale*

DURING the severe winter months at Rangely field, Colorado, the paraffin buildup is extremely heavy, necessitating frequent tank-cleaning jobs.

The manual method of cleaning tanks is time-consuming, costly, and hazardous. Several thousand tanks had been cleaned this way from 1944-51 using accepted field methods.

However, a recently perfected mechanically induced agitation, or recycling, system has removed a serious safety hazard and has also enabled the company to keep tank bottoms suspended in the crude, which increases the salable volume of the oil.

How it works . . . A portable unit, consisting of a direct-fired heater and a recycling pump driven by a small gasoline engine, was mounted on a four-wheel rubber-tired trailer at a cost of about $1,900. This portable unit can be moved to each tank battery where permanent installations are not justified.

There two lines are laid from the recycling unit which is located a safe distance from the tank to be cleaned. One of these lines is a 2-in. suction line connected to the water draw-off while the other is a 2-in. discharge line back into the tank. A gas line is then laid to the nearest field gas system connection to be used for fuel.

THE AUTHOR, at left, and Roustabout Marlin Cox examine portable heater in use at Rangely.

Cleaning . . . When it is time for a tank to be cleaned the heavy paraffin mixture in the bottom is usually about 18 in. deep—or approximately 97 bbl. of fluid. Before recycling begins, about 100 bbl. of clean oil is either produced into the tank or is left there by advance arrangements with the pipe line gager. The entire accumulation is then drawn off by the recycling pump, circulated through the portable heater and then discharged back into the tank.

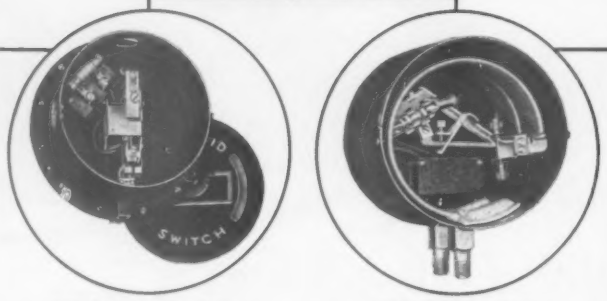
The heater raises the temperature of the mixture to 150° F., and then continues to circulate the hot fluid until the paraffin in the heavy bottom is back in solution as pipe-line oil. The water accumulation is drawn off at the heater during the operation. They recycling period takes about 8 hours.

After completion of recycling, one

* Assistant field foreman, The California Co., Rangely Field, Colo.

DIFFERENTIAL PRESSURE CONTROLS
FOR LOW OR HIGH PRESSURES

MERCOID



FOR LOW PRESSURES

Mercoid Type PPQ Diaphragm Differential Pressure Controls operate from minute changes (.03" water) in the difference between two pressures.

Ranges to cover most applications (inches of water) 6" vacuum to 6" pressure, and 30" vacuum to 30" pressure. Available for various circuit arrangements.

Electrical Capacity—0.3Amp. at 115V., A.C. or 0.15Amp., at 230V., D.C. Can be furnished in explosion-proof or weather-proof cases.

WRITE FOR BULLETIN CA-3P

FOR HIGH PRESSURES

Mercoid Type BB Differential Pressure Controls open or close a switch contact according to a change in the difference between two pressures.

Type BB employs two Bourdon tubes, each responsive to a pressure condition to operate a Mercoid Magnet operated mercury switch as the difference in pressure between them increases or decreases. Available in ranges 60 p.s.i. to 2,500 p.s.i.

Electrical Capacity—A. C. 115V., 5Amp., 230V., 2Amp., D. C. 115V., 2.5Amp., 230V., 1Amp.

WRITE FOR BULLETIN CA-6DP

EQUIPPED WITH MERCOID HERMETICALLY SEALED MERCURY SWITCHES

If you have a control problem involving the automatic control of pressure, temperature, liquid level, mechanical operations, etc., it will pay you to consult Mercoid's engineering staff—always at your service.

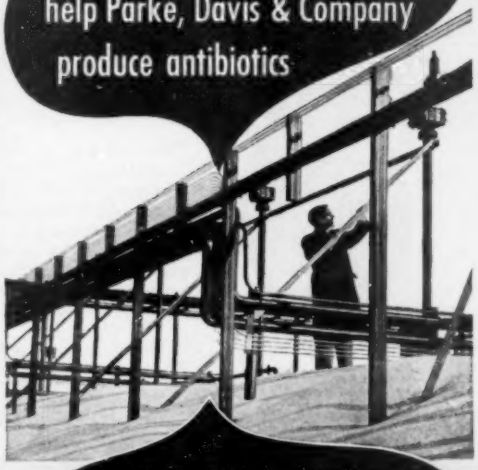
THE MERCOID CORPORATION
4209 W. BELMONT AVENUE, CHICAGO 41, ILLINOIS
New York: 205 East 42nd St. Phildadelphia: 3137 N. Broad St.

AN ECONOMY FACTOR IN REFINERY OPERATION

Proved long life and stubborn resistance to corrosion make cast iron pipe a contributing factor in lowering plant maintenance per barrel of crude. Replacing shorter-lived pipe with cast iron pipe has demonstrated this in many refineries. Cost per term of service decreases. Interference with production, caused by frequent replacements, ceases to be a headache. Cast iron pipe works hand-in-glove with plant management to keep maintenance cost down in many refinery operations. Available with bell-and-spigot, plain end and flanged, or with standardized mechanical joints. Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, 1015 Peoples Gas Bldg., Chicago 3, Illinois.

CAST IRON PIPE
FOR LONG LIFE AND ECONOMY

More than 4 miles of ALCOA Aluminum Tubing help Parke, Davis & Company produce antibiotics



ALCOA UTILITUBE—*more than four miles of it*—connects outdoor tanks with gages at Parke, Davis & Company's new Chloramycetin plant at Holland, Michigan—the world's only plant producing antibiotics by chemical synthesis. Alcoa's all-purpose aluminum coiled tube is used for instrument line service at this 124,000-gallon tank farm.

Alcoa Utilitube offers savings up to 40% over copper . . . has excellent on-the-job forming and flaring properties. It is available in economical, long lengths up to 1,000 feet or more, depending on size. It stands up well under vibration . . . has high resistance to most industrial atmospheres and to many liquids and gases.

In petroleum service, Alcoa Utilitube will not form sludge or gum . . . will not discolor or contaminate the fluid it carries.

Use Alcoa Utilitube for:

- Air for pneumatic and hydraulic control circuits and brake lines.
- Gasoline and fuel oil for internal combustion engines.
- Lubricating oils for engines and machines.
- Fluids for hydraulic systems.

For complete details, write for the new booklet: *Alcoa Utilitube.*

ALUMINUM COMPANY OF AMERICA
1003-B Alcoa Building, Pittsburgh 19, Pa.

Alcoa Aluminum

ALUMINUM COMPANY OF AMERICA

Rugged, extra-strength BLOCKS engineered for oil industry needs

SHOWN at left is a Model 4140 Washington moving block of 30-ton capacity, designed for 1½" wire rope. Manganese sheave, cast steel sides, bronze bushed—an extra strong, *economical* block for heavy moving and construction work.

Other models of Washington blocks adaptable to oil field construction and operation include cat blocks, rigging blocks, snatch blocks and hoisting blocks. All are designed for extra strength and long life. All are backed by outstanding manufacturing facilities and specialized experience in block production.

Write for Catalog No. 35, showing the full line of Washington blocks, fairleaders and related equipment. Address Washington Iron Works, 1500 6th Ave. South, Seattle 4, Washington.

WASHINGTON IRON WORKS

Since-1882

WASHINGTON IRON WORKS

You'll PREFER HERCULES Products

Whatever items you choose from HERCULES production equipment, you are certain to be satisfied because HERCULES products are proven by 26 years field and manufacturing experience.

THE HERCULES LINE INCLUDES:

PUMPING WELL EQUIPMENT
- Tubing Hangers (Various Types)
- Pumping and Flowing Tees
- Duplex "Cone-Pak" Stuffing Boxes
- Berry Pattern Casing Heads

CASING HEADS
- Slip Type, "Overhead Packed"
- Louisiana Pattern with Collar Suspension
- Louisiana Pattern with Slip Suspension

TUBING HEADS
- Various Types and Designs of Tubing Heads, including Stripper Type Tubing Heads

MISCELLANEOUS
- Tubing Spiders
- Various other equipment

Write for free bulletins on the HERCULES products in which you are interested.

SOLD THROUGH ALL SUPPLY STORES

HERCULES TOOL COMPANY

Manufacturers of Oil Field Equipment

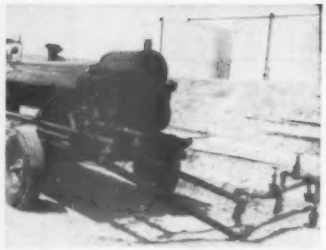
TULSA, OKLAHOMA

General Office and Plant: 17th and Phoenix — P. O. Box 286

Telephone 3-4186

Export Representative: OIL FIELD EQUIPMENT CO., INC.

T. E. Ward, President • 30 Church St., New York 17, N. Y.



CLOSE-UP showing connections from heater to tank.

of three things is done with the salvaged oil:

1. The heated solution is sometimes transferred to another tank to be shipped.
2. Sometimes it is transferred to a tank that is being produced into.
3. The heated crude may be transferred to another tank which is ready to be cleaned.

The first two methods of handling are used to keep the paraffin in solution until it moves into the pipe line. The third method, transferring into another tank which needs cleaning, cuts down the heating time for cleaning the next tank by using the already heated solution.

Old method . . . Now contrast this efficient operation to the old manual tank cleaning method which was used several thousand times from 1944-51. In the old method it was necessary to open the tank and block off the lines and vents. From the manhole opening, the heavy fluid was raked with long wooden rakes into a trough where it gravitated to a sump in the corner of the fire wall from where it was hauled away by a vacuum type tank truck.

After the greater part of the paraffin buildup had been removed, the tank was then thoroughly cleaned from the inside by employes wearing fresh air hose masks and equipped with rakes constructed with composition belting edges. During the entire operation, there was an ever present danger of fire and expansion due to the gaseous crude oil vapor.

Prove satisfactory . . . Although the portable heaters at Rangely are admittedly somewhat inferior to the use of permanent heater-treaters or recycling pumps, it is a very satisfactory alternative at those batteries where costly permanent installations are not yet justified.

Portable heaters for recycling tank bottoms accomplish the primary objective of making it unnecessary for tanks to be open and employes being exposed to the potential danger of fires and explosion while working in and around tanks being cleaned.

Tungsten Carbides

good, bad and indifferent...

To a great many people tungsten carbide is *just tungsten carbide.* If those words appear on the container, that's all there is to it. Yet these same people are likely to get pretty fussy when they buy other materials—steel, for instance. They naturally want steel of a certain analysis, they want to know the mill that produced it and whether it has a trade name for identification. They're mighty interested in the *quality* of the steel they're getting!

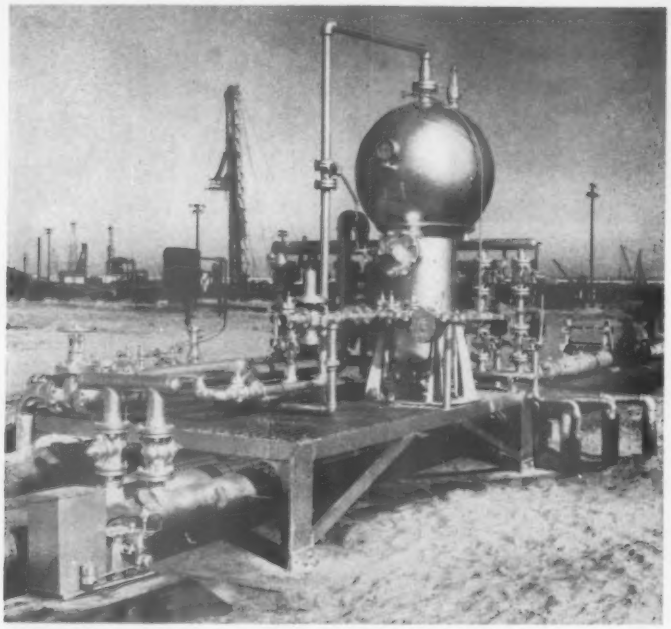
As a matter of fact, *quality* is as important in tungsten carbide as it is in the steel you buy, the car you drive, the clothes you wear and the food you eat...perhaps even more important, because tungsten carbide is not an end product itself but is added to a piece of costly equipment designed to do a given job better, more efficiently and at less cost. *The only bargain here is in the results you get!*

There is no product in the world that can't be made cheaper and sold for less. Stoody Company; with unsurpassed manufacturing facilities, could more easily than most plants turn out tungsten carbides of inferior quality at a price. It happens, however, that we're interested primarily in quality because we believe it is the only factor which promises full value for the buyer and assures our own success over the years. Things have worked out that way so far—and we still think this is the best way to make friends and build a business.

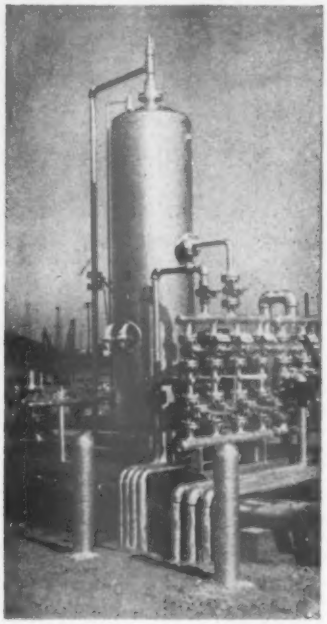
Borium—the Stoody trade name for pure tungsten carbide as we produce it—is of the highest possible quality. We have been making it for 26 years, were in fact the first to produce this material commercially. We feel that our manufacturing processes are the most efficient in the industry, allowing us to provide highest quality at the lowest possible cost. Our facilities give us absolute control of carbon content, eliminate practically all impurities and produce crushed particles of the generally desired cubical shape.

We spend a good deal of time and money just to make sure of the quality and uniformity of this material. When you buy Stoody Borium, whether it be as bulk, Tube Borium, Borod, Inserts or Castings, you *know* the welding properties of the rods, the shape of the particles, the purity of the material. And you *know* that there is no finer, more dependable product to be had.

STOODY COMPANY



REDESIGNED TRAPS are all placed on platforms above the gathering lines as a space-saving measure. Generally each trap serves four wells.



MANIFOLDS are provided for crude and gas withdrawn through the casing.

Standardized Traps

They are designed to meet characteristics of pumping wells served in Long Beach Harbor's Wilmington field

D. H. Stormont

IN the Long Beach Harbor area of Wilmington field, California, Long Beach Oil Development Co. is in the process of installing standardized traps designed to meet the characteristics of the pumping wells they serve.

When this portion of the field was originally developed the general practice was to install a separator alongside the well or between the two wells it served. Declining productivity resulted in much surplus trap capacity.

Opportunity to correct this situation came when subsidence of the surface became so great that an extremely large earth-filling operation had to be undertaken.

In performing this work the pumping units are removed, the well casing extended to the intended new level, and then after the fill is made the pumping units, flow lines, and other producing facilities are reinstalled. At Pier D, where the accompanying photographs were taken, some wells were elevated as much as 18 ft.

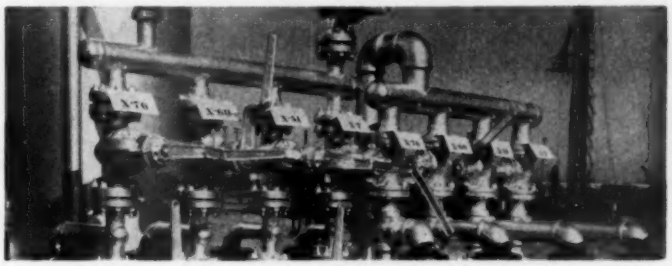
When the traps were reset, they were placed on small platforms which span the gas and oil-gathering lines. Space is at a premium in this congested port area; in their new setting the traps do not add to this condition.

Serve four wells each . . . In a typical setting each separator serves four wells, with manifolding provided so that one well's production can be tested while the other three produce directly into the gathering lines. A second manifold is provided, with similar provisions for testing, for the gas lines which lead to the casing of these four wells. Practice of maintaining a reduced pressure on the casing was adopted when it was found to be beneficial to a well's productivity.

Handling gas . . . Little gas is contained in the produced crude so that unless the well is being tested, flow is through the manifold and into the gathering lines. Any entrained gas then is recovered at central tank farms, where large boots connected to vapor-recovery systems serve in effect as second-stage traps. Gas taken from the casing of the individual wells likewise is directed to the gathering line without measurement.

Handling oil . . . While three wells' production is being handled in this manner, oil from the fourth is run to the separator and then metered before it rejoins that of the other three wells. At the same time, valves in the gas manifold are switched so that the well's gas output is being metered. In both systems piping is provided for bypassing the checking equipment if this is necessary for any reason.

Control . . . To provide a nearly constant, gas-free column of crude for metering, the float control in the trap actuates a valve in the outlet gas line rather than in the oil line. Under this method of control a cushion of gas is maintained in the separator, forcing



MANIFOLDING (right) provided at each trap permits the oil and casing-gas production of any of the four wells to be checked at will. The coal-tar coatings on the flow-line flanges were found necessary to protect the insulators from being "shorted out" (see black sections). These installations are in Long Beach Harbor area of Wilmington field, California, and belong to Long Beach Oil Development Co.

the crude to exit through the outlet line and through the meter. Only when sufficient gas accumulates to force the crude below the present operating level does the float operate to draw gas from the trap.

When the trap is dumped the gas passes through a check valve and is fed into the oil line which bypasses the trap. Depending upon how far from the tank battery the separator is located, pressures of 30 to 70 psi. are maintained in the traps.

Protecting insulators . . . Another point of interest is the provision for protecting the insulators used to isolate the individual flow lines and wells from any currents existing in the gathering lines. Fog and dampness were found to sometimes result in the collection of sufficient moisture to cause the insulators to lose their effectiveness. To prevent this, a coat of coal-tar enamel was poured over the flanges, using a tar paper form temporarily wired around the connection.

Loops elevated . . . When the gathering lines were installed they were looped around the clusters of wells. Formerly placed underground, they now are on concrete pillars aboveground for ease of inspection and to reduce corrosion. To prevent the lines being buckled as a result of further land subsidence the lines are anchored at intervals with slip-joints provided to absorb any movement.

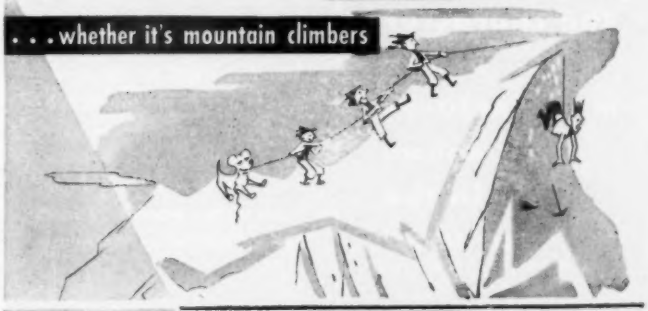
Turn Your Ideas Into Cash

Do you have an idea which will save time, money, or effort on your job—either in the fields or in the plants? Then why not let others know about it?

The Journal pays cash for all acceptable items. Address yours to: Editor, "On the Job," The Oil and Gas Journal, Box 1260, Tulsa, Okla. Photographs and manuscripts will be returned if requested.

It takes a FULL team

. . . whether it's mountain climbers



. . . or digging equipment

for big jobs

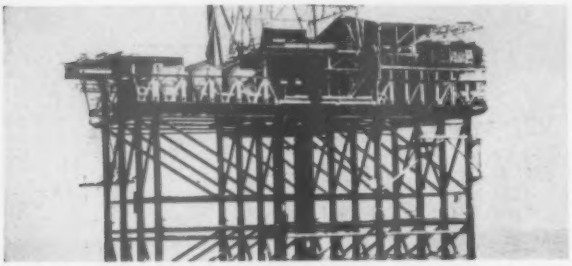
for medium jobs

Sherman for small jobs. The Sherman Power Digger is designed so that you get all the advantages of power digging on the smaller jobs where larger equipment is costly, time-consuming, and upsetting to work schedules. Thousands of users have proved that the Sherman Power Digger reduces costs. Write today for descriptive literature A5.

Designed, Engineered and Manufactured Jointly by
SHERMAN PRODUCTS, Inc.
Royal Oak, Michigan
WAIN-ROY CORPORATION
Hubbardston, Mass.

Patent No. 2,303,825
Other patents pending

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN



OFFSHORE oil derrick is fitted with Monel sheathing on pilings to ward off corrosion by salt spray.

Oil derricks off gulf wear leggings for corrosion protection

AS a protection against salt water and spray, oil derricks in the Gulf of Mexico wear metal leggings for protection against gnawing corrosion.

In these waters, the salt spray cuts incessantly into any object, including steel pilings which support the rigs on platforms miles from land.

The portion of the pilings which take the most punishment exists within the "splash area" at all tides. Cathodic protection methods have proven adequate for sections of steel below the water, and paint offers protection above it. But it is this "in-between" area that catches the spray and wash of the waves, which must have special attention.

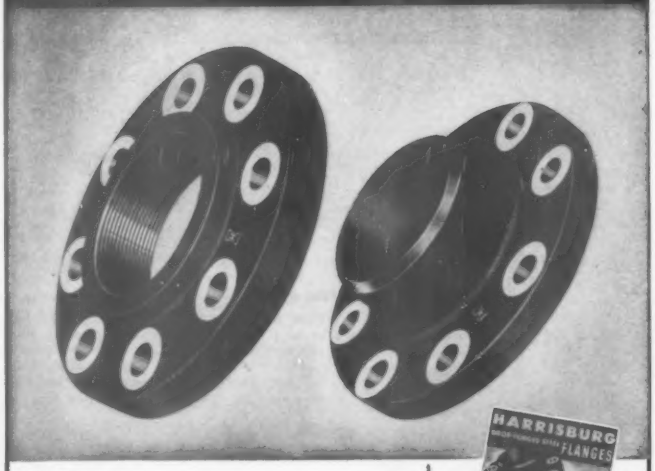
Problem licked . . . The answer to this problem is to encase the piles in leggings. Experimental sheathing of Monel to cover the same exposed areas was placed on the supports of one offshore well, on an experimental basis, and for 3 years the sheaths have defied attack by corrosion.

No damage whatsoever has been observed to either the pilings or the leggings since the Monel sheaths were installed.

LEGGINGS made of Monel protect the steel pilings. This photograph was taken at low tide when the entire sheathing was exposed.

the character of the manufacturer shows in the product

Harrisburg Drop Forged Steel Pipe Flanges are manufactured to A.S.A. Standards. Accuracy in machining produces threads that are virtually perfect in height, angle, taper, and gauging . . . the result of Harrisburg's 99 years of manufacturing experience.



HF52-2

100 Years in Pennsylvania's Capital

Harrisburg Steel CORPORATION

HARRISBURG 6, PENNSYLVANIA

A copy of the Harrisburg Flange Catalog will be mailed, together with prices, upon request.

GAS TURBINES AND CENTRIFUGAL COMPRESSORS—3

Selecting the Design Point

by T. R. Rhea* and J. S. Quill*

IN the preceding installment, combined compressor characteristics and pipe-line pressure-flow characteristics were shown, for a discharge pressure of 813 psia. at the Cornudas station of the El Paso Natural Gas Co. system. Using that chart the flexibility of adjustable speed centrifugal compressors was illustrated.

Fig. 1 on this page is a similar chart for discharge pressure of 750 psia. with pressure-flow characteristics for 813, 750, and 700 psia. superimposed on the compressor characteristics.

Suppose the station downstream from Cornudas demands more flow and begins to pull down the discharge pressure at Cornudas to say 750 psi. What amount of flow could Cornudas maintain at 750 psia. discharge assuming Guadalupe can also deliver at only 750 psia.?

Fig. 1 shows that when Cornudas is putting out its maximum wintertime horsepower of 12,800 that it can handle 1,070 million standard cubic feet per day and maintain a pressure of 750 psia. discharge. The turbines would run at approximately 5,400 r.p.m.

Such questions and answers demonstrate not only the flexibility of the adjustable speed compressors to help pack and unpack the line to the limit of their horsepower ability but they also illustrate the importance of picking the compressor design point speeds at some lower value than the maximum available of 5,500 r.p.m. so that they can be speeded up to obtain the extra horsepower available in cold weather to provide more flow and compression ratio.

The design point . . . Fig. 2 shows the flow-compression ratio characteristic to fully load one 5,000-hp. gas turbine and two 5,000-hp. gas turbines in series.

A single-stage centrifugal compressor is limited to a compression ratio of about 1.33 and Fig. 2 shows that the minimum flow to fully load the gas turbine of this rating is about 350 million standard cubic feet per day. Of course, multistage compressors could be obtained to give higher compression ratios to lower flows and fully load the turbine. Fig. 2 is convenient for quick estimating purposes of the combination of turbine and compressor.

*General Electric Co. From paper presented at A.S.M.E. meeting, December 1952.

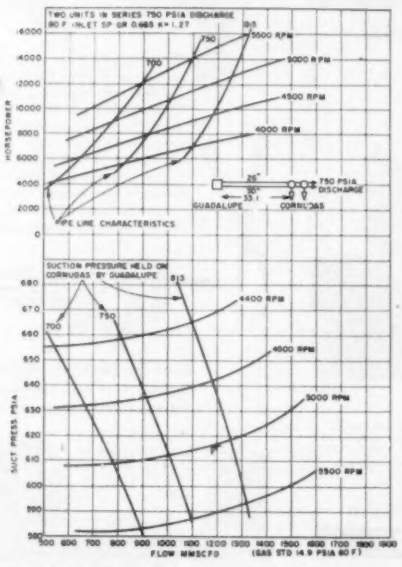


Fig. 1—Centrifugal-compressor and pipe-line characteristics superimposed.

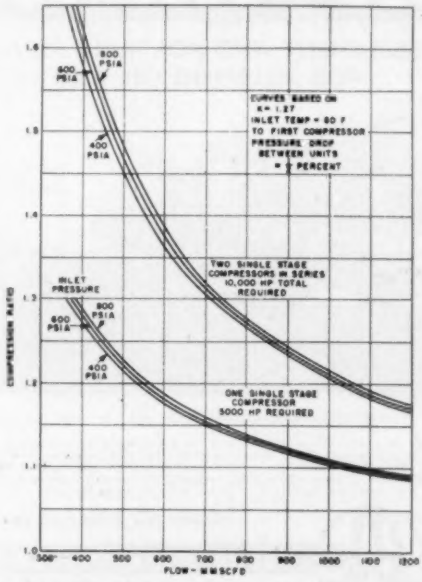
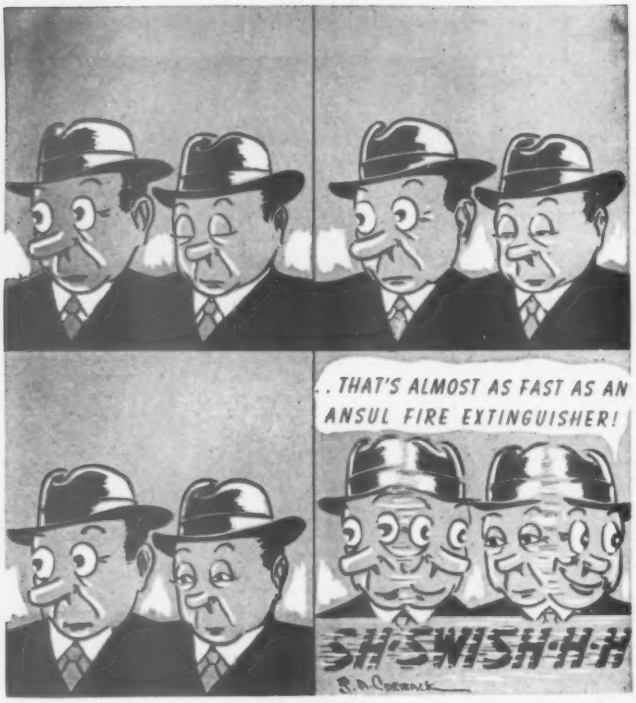

800 PSIA
600 PSIA
400 PSIA
CURVES BASED ON K = 1.27 INLET TEMP = 80 F TO FIRST COMPRESSOR PRESSURE DROP BETWEEN UNITS = 5 PERCENT
TWO SINGLE STAGE COMPRESSORS IN SERIES 10,000 HP TOTAL REQUIRED
INLET PRESSURE
ONE SINGLE STAGE COMPRESSOR 5000 HP REQUIRED
COMPRESSION RATIO
FLOW - MMSCFD

Fig. 2—Flow vs. compression ratio to fully load one or two 5,000-hp. gas turbines.



SEE PAGE 244

ROLO WELLCHECKERS

PERMANENT AND PORTABLE SEPARATORS FOR METERING OIL AND GAS

Trailer-mounted Wellcheckers: 1H—3607, 1H—2406 and 1H—1604

Made in various sizes and working pressures to fit any operation, Rolo Wellcheckers enable the operator to check well production daily and to secure accurate tax and royalty records. Rolo Wellcheckers are shipped completely piped and ready to operate.

Write, wire or phone Rolo today regarding your well testing and oil metering requirements. See Composite Catalog or send for new illustrated Bulletin.

Crude Oil Metering Specialists

ROLO MANUFACTURING COMPANY

P. O. BOX 6763, HOUSTON 5, TEXAS

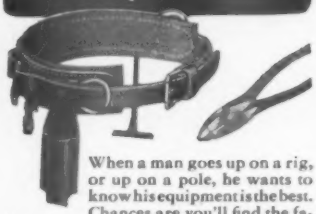
BRANCHES: Corpus Christi, Midland, Kilgore, Tulsa, New Orleans, Los Angeles, Bakersfield, Casper, Calgary, (Alta.)

Petroleum Industry Consultants, Apartado 8992, Caracas, Venezuela

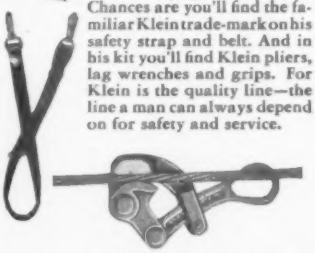
EXPORT OFFICE: R. S. Stokvis & Sons, Inc., 17 Battery Place, New York, N. Y.

KLEINS

Quality A MAN CAN DEPEND ON



When a man goes up on a rig, or up on a pole, he wants to know his equipment is the best. Chances are you'll find the familiar Klein trade-mark on his safety strap and belt. And in his kit you'll find Klein pliers, lag wrenches and grips. For Klein is the quality line—the line a man can always depend on for safety and service.



ASK YOUR SUPPLIER

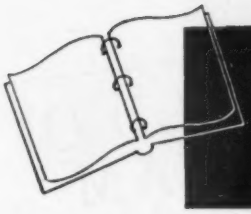
Foreign Distributor: International Standard Electric Corp., New York

Write for your free copy of the Klein Pocket Tool Guide today!

"Since 1857"

Mathias KLEIN & Sons

3200 BELMONT AVE. CHICAGO 18, ILL.



REFINER'S NOTEBOOK

ALLOY STEELS FOR OIL REFINING—4

A.P.I. Committee Recommendation . . .*

A SIGNIFICANT conservation of molybdenum will be realized through reduction of 0.05 per cent and 0.10 per cent in the molybdenum contents of all grades of steels having nominal contents of this element of 0.5 per cent and 1.0 per cent, respectively. This will not entail any reduction in allowable stresses for these steels. In the light of present knowledge, it is believed that a further reduction in the minimum molybdenum content below 0.4 per cent recommended would necessitate a lowering of the allowable stresses. The net result would be a greater actual use of molybdenum due to the heavier sections that would be required.

A further conservation of molybdenum can be effected by restricting the use of carbon molybdenum steel to temperatures above 775° F.

Additional conservation can be achieved through a decrease in the number of grades of allowable chromium-molybdenum steels. The committee recommends that this number be reduced to five and that two of these grades containing 1 per cent molybdenum be approved only for the comparatively few cases where service conditions of unusual severity prevail. This reduction in the number of grades will eliminate all unnecessary duplication of stocks and increase the availability of the allowable grades.

The committee does not believe that there are any safe substitute steels for the A.I.S.I. chromium-molybdenum 4140 steel used for bolts or for the standard nickel steels used at very low temperatures. Continued approval of these steels for those applications will not require significant amounts of molybdenum and nickel.

*From report by A.P.I. Interim Advisory Committee on Alloy Steels, 1952.

The A.P.I. Interim Advisory Committee on Alloy Steels submits the following recommendations to Petroleum Administration for Defense for the purpose of effecting conservation of critical alloys. These recommendations apply to the allocation of alloy steels to the petroleum industry for use in oil refineries.

1. No alloy steels containing molybdenum should be approved for service below a metal temperature of 775° F., except for bolts and except when a chromium-molybdenum steel is required for resistance to corrosion.

2. Carbon - molybdenum steels may be used for service at metal temperatures above 775° F. when required for strength at temperature. Chromium-molybdenum steels may be used at metal temperatures above 775° F. when required for resistance to corrosion, for resistance to graphitization and/or for strength at temperature.

3. All refinery bolting should be suitable for high temperature service, and A.I.S.I. 4140 steel should be approved for such bolting. (Note: All orders for A.I.S.I. 4140 steel bolting should specify, "for high-temperature service".)

4. The molybdenum content of 0.5 per cent molybdenum steels should be not less than 0.4 per cent.

Table 1

A.I.S.I. Grade	Nominal Per Cent—Chromium	Nominal Per Cent—Molybdenum
T M		0.5
T 1-¼	1.25	0.5
T 2-¼	2.25	1.0
T 5	5.00	0.5
T 7	7.00	0.5
T 9	9.00	1.0

Note: T 2¼ steel should be permitted only when justified by unusual severity of conditions. T 9 steel should be restricted to severely corrosive services. The molybdenum content should not be less than 0.80 per cent for both the T 2¼ and T 9 grades.

5. Austenitic stainless chorimum-nickel steels should be approved for replacement of similar steels in installations wherever in service and so equipped.

6. Alloy steels for tubular products and forgings (valves, fittings, flanges, other pressure-containing parts) should be restricted to the grades given in Table 1.

7. Alloy steels for castings (valves, fittings, flanges, and other pressure-containing parts) should be restricted to the grades given in Table 2 below.

Table 2

A.S.T.M. Symbol	Nominal Per Cent—Chromium	Nominal Per Cent—Molybdenum
WC1		0.40-0.65
WC6	1.00- 1.50	0.40-0.65
WC9	2.00- 2.75	0.80-1.20
C5	4.00- 6.50	0.40-0.65
C12	8.00-10.00	0.80-1.20

Note: WC9 steel should be permitted only when justified by unusual severity of operating conditions. C12 steel should be restricted to severely corrosive services. The molybdenum content should not be less than 0.80 per cent for both the WC9 and C12 grades.

8. Alloy steels should be approved for temperatures below −20° F. to meet applicable A.S.M.E., A.P.I.-A.S.M.E., or A.S.A. Code requirements.

9. Ferrous and nonferrous alloys in general usage under normal conditions should be approved for trim for valves, fittings, and other similar applications. This includes austenitic stainless steels, Monel, Hastelloy, Stellite, and other such alloys.

10. Alloy steel welding rods in common usage for welding the alloy steels herein recommended should be approved.

11. Recommendations on furnace castings, excluding pressure-containing parts, should be in accordance with NPA Order M-80, Schedule C, Part II.

IMPORTANT DATA FOR WELDING ROD PURCHASERS

WELD-O-GRAM

SUPPLIED BY A. O. SMITH FOR IMMEDIATE RELEASE

IN COMPETITIVE TESTS RADIOGRAPHS OF 50,000 WELDED JOINTS IN CROSS COUNTRY PIPE LINE PROVE SW-80 ELECTRODE CUTS REJECTS IN HALF

Made by the world's largest manufacturer of transmission line pipe and casing.

SW-80

A new, E-7010 Electrode for field welding of line pipe. Just one electrode for stringer, hot, filler and finish passes. Same strength throughout. Easy to manipulate. Deposited weld metal is superior in strength and ductility.

HERE'S THE STORY...

Radiographic inspection of 50,000 joints was made during construction of a major transmission main.

One-fourth of the inspected welds were made with the A. O. Smith SW-80 rod. Rejections were only 1%. Rejections among the rest of the welds made with competitive rods were *more than* 2%.

In other words more than twice as many joints welded with competing rods were rejected as compared with those welded with the SW-80.

If all joints had been welded with the A. O. Smith pipe line electrode, rejects would have been cut by 500. This could conceivably yield a saving that would more than repay total expenditures for electrodes used on the entire pipe line comprising approximately 200,000 joints.

No wonder the new SW-80 electrode is gaining acceptance all along the line!

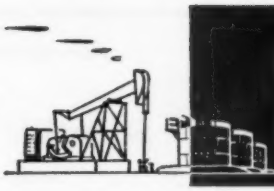
Write for free pocket-size electrode handbook.

A. O. Smith Corporation, Dept. OG-253
Milwaukee 1, Wisconsin
International Division, Milwaukee 1

A.O.Smith
WELDING PRODUCTS

Made by welders . . . for welders

by
Ralph F. Nielson*



Unsteady-State Flow of Gases in Porous Media—Pressure Decline

IN last week's number of this series one example of unsteady-state flow of gases in porous media was discussed, namely, the transient effect that occurs when a well is suddenly opened to a low pressure. These transient effects in gas reservoirs are not of extreme economic importance, but the equations developed give some idea of the time factors involved. A knowledge of the order of magnitude of these time factors is useful in determining, for instance, how long after opening or closing a gas well dependable flow or pressure measurements can be taken.

Reservoir-Pressure Decline

Of greater practical importance than the transient effects are the production decline and depletion of the reservoir. Gaseous flow in a porous medium under declining pressure, after cessation of any transient effects, represents one type of unsteady-state flow. A few idealized examples will be given to show the types of calculations involved.

The pressure distribution in a gas reservoir draining into a completely penetrating well is given approximately (making the usual idealized assumptions) by:

$$P^2 = P_w^2 + (P_e^2 - P_w^2) \times \ln (r/r_w)/(\ln (r_e/r_w) \quad (1)$$

where w refers to the well and e to the outer edge of the reservoir. Fig. 1 shows such a distribution. It is apparent from the figure that most of the pressure drop is near the well. This is to be expected in a radial system since velocities increase very rapidly as the gas passes the small cross-section of sand near the well.

The volume of gas, corrected to standard conditions, per unit sand volume at any point is given by:

$$q = 520\ \phi\ P/TZ \quad (2)$$

*Associate professor of petroleum and natural-gas engineering, Pennsylvania State College.

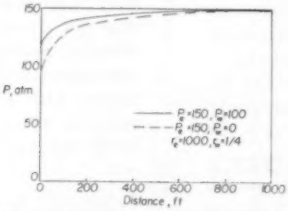


Fig. 1—Pressure distribution for radial flow of gases in a porous medium.

where ϕ is the fractional porosity, P the pressure in atmospheres, T the reservoir temperature in °R, and Z the compressibility factor. From Fig. 1, the region of high-pressure drop on a volumetric basis is only a small part of the reservoir. For practical calculations one may therefore regard P as constant at P_e in estimating the total volume Q, which is then:

$$Q = 520\ \phi\ P\ V/TZ \quad (3)$$

where V is the total volume of the formation.

The rate of pressure decline in a flat circular reservoir, assuming isothermal flow and validity of the perfect gas laws, is obtained by setting the rate of decline of Q equal to the flow as given by the radial flow formula:

$$-\frac{dQ}{dt} = -\frac{dQ}{dP}\frac{dP}{dt} = -\frac{520\ \pi\ r_e^2\ \phi\ h}{T} \times \frac{dP}{dt} = \frac{520\ \pi\ h\ K\ (P^2 - P_w^2)}{T\ \mu \ln (r_e/r_w)} \quad (4)$$

or

$$-\frac{dP}{dt} = \frac{K\ (P^2 - P_w^2)}{\phi\ \mu\ r_e^2 \ln (r_e/r_w)} \quad (5)$$

where t is the time in seconds, μ the gas viscosity in centipoises, r_e the reservoir radius in centimeters, and K the permeability in darcies. Integration of Equation 5 gives:

$$t = \frac{\phi\ \mu\ r_e^2 \ln (r_e/r_w)}{2\ K\ P_w} \times \ln \frac{(P_1 - P_w)(P + P_w)}{(P_1 + P_w)(P - P_w)} \quad (6)$$

where t is the time in seconds to reach pressure P, starting with P_1.

For the hypothetical case of zero bottom-hole pressure at the well, the integration is simple and gives:

$$t = (\phi\ \mu\ r_e^2/K)\ (1/P - 1/P_1) \times \ln (r_e/r_w) \quad (7)$$

To illustrate Equations 6 and 7 consider a gas reservoir of 1,000-ft. radius completely penetrated near the center by a bore hole of ¼-ft. radius. Also ϕ = 0.15, μ = 0.01, K = 0.1, and P_1 = 150 atm. To find the time required for the pressure to drop to 75 atm., assuming P_w = 20, we may write:

$$t\ (\text{days}) = \frac{0.15 \times 0.01 \times 1{,}000^2 \times 30.5^2 \times 2.3 \times 3.602}{2 \times 20 \times 0.1 \times 86{,}400} \times 2.3 \log \frac{130 \times 95}{170 \times 55}$$

$$= 1{,}338/40 \times 2.3 \log 1.321 = 9.3 \text{ days} \quad (8)$$

If P_w = 0:

$$t = 1{,}338\ (1/75 - 1/150) = 8.9 \text{ days} \quad (9)$$

It is seen that for the first part of the pressure decline it makes little difference whether the well pressure is zero or 20 atm. This result would be expected since the flow is proportional to the difference of the squares of the reservoir and well pressures. When the reservoir pressure is close to that of the well bore, then of course an erroneous calculation would result from using the formula for zero well pressure.

Generally speaking, the prediction of pressure decline in gas reservoirs is a matter of material balance and application of the gas laws. The estimation of gas reserves (and reservoir pore volume) from production data and pressure decline was described in one of the early installments of this series.[2] If, for instance, the pressure has declined to half its original value or, more exactly, if P/Z has declined to half its original value, then half the original gas has been produced.

If the reservoir is producing at a constant rate C, then $dQ/dt = -C$ and, from Equation 3:

$$\frac{dQ}{dt} = \frac{520\ \phi\ V}{TZ}\frac{dP}{dt} = -C \quad (10)$$

or, the time required for the pressure to drop from P_1 to P_2 is:

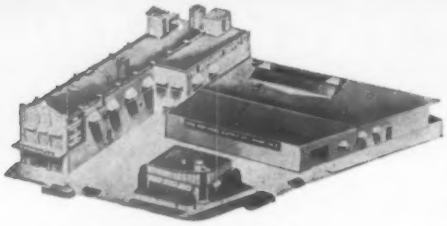
$$t = \frac{520\ \phi\ V\ (P_1 - P_2)}{CTZ} \quad (11)$$

taking an average value of Z. This formula would be expected by direct inference from the gas laws.

References

1. Muskat, Flow of Fluids in Porous Media, McGraw-Hill.

2. Calhoun, "Application of Gas Behavior to Reserve Estimates." This series, No. 304, The Oil and Gas Journal, October 18, 1947.



Manufacturers and Jobbers

of

Scientific Instruments

Manufacturers of

Ac-Me and R. S. Specialties

Ac-Me RECORDING GRAVITOMETER
Ac-Me SPECIFIC GRAVITY GAS BALANCE
Ac-Me PRESSURE VACUUM PUMP
R. S. PORTABLE VACUUM PUMP
R. S. MERCURY CLEANER
R. S. MANOMETER
R. S. DEAD WEIGHT GAUGE
R. S. DEAD WEIGHT TESTER
R. S. ORIFICE WELL TESTER
R. S. MOISTURE TESTER

R. S. FLAT BORE YEL-O-BAK THERMOMETERS
R. S. STREAMLINED HYDROMETERS
R. S. PULSAMETER
R. S. PRESSURE HYDROMETER JARS
R. S. VAPOR PRESSURE BOMB
R. S. DIAMOND CORE DRILL
R. S. THERMO PLUMB BOB THERMOMETERS
R. S. THERMOSTAT TEMPERATURE CONTROLS
R. S. HIGH PRESSURE CONSISTOMETER
R. S. SMOKE METERS

Write for Bulletin No. 50

Complete Line of Scientific Laboratory Equipment

Also Complete line of CENTRAL SCIENTIFIC SPECIALTIES

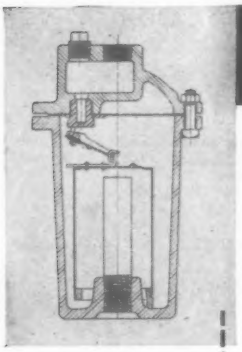
cenco

Cenco . . . one dependable source of supply for everything you need in scientific instruments and laboratory supplies. Over 15,000 items . . . 14 branch offices and warehouses.

R.S.C.

REFINERY SUPPLY COMPANY
621 EAST FOURTH STREET • TULSA 3, OKLAHOMA
2215 McKINNEY AVENUE • HOUSTON 3, TEXAS

CENTRAL SCIENTIFIC COMPANY
1700 IRVING PARK ROAD • CHICAGO 13, ILLINOIS
CHICAGO NEWARK BOSTON WASHINGTON DETROIT SAN FRANCISCO
SANTA CLARA LOS ANGELES TORONTO MONTREAL VANCOUVER OTTAWA



INVERTED BUCKET TRAPS with light weight buckets for draining light liquids from gases. The same design and operation proved on thousands of steam trap applications.

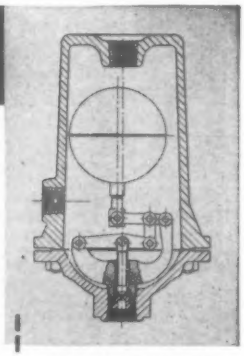
LIQUID LEVEL CONTROL OF CORROSIVE LIQUIDS?

. . . These ARMSTRONG TRAPS are the Maintenance-Saving Answer

ARMSTRONG traps extensively have been used to drain corrosive liquids from receivers and maintain the liquid level at any desired point. Bodies and caps have been furnished of nickel, aluminum-bronze, monel, stainless steel and other metals which can be cast or forged. Working parts, also, have been of nickel, monel, stainless steel or any weldable material available in sheet, rod and bar form.

Traps made of low carbon chrome iron, for example are being used to drain 60% Nitric acid from receivers at 75-100 psig. Perhaps you have a corrosive liquid control problem that can be solved with Armstrong traps. For complete data write:

ARMSTRONG MACHINE WORKS
868 Maple Street • Three Rivers, Michigan



BALL FLOAT TRAPS with compound or direct lever mechanism for draining water or light liquids from gases or other liquids. Also widely used for air or gas relief service.

ARMSTRONG STEAM TRAPS • AIR TRAPS • GAS TRAPS
AIR RELIEF TRAPS • LIQUID LEVEL TRAPS

Part 25 of a series

by Dr. B. E. Lauer, Head, Department of Chemical Engineering, University of Colorado

h_f HEAT TRANSFER

COEFFICIENT of HEAT TRANSFER through FILM between OUTSIDE SURFACE of a COOL TUBE and WARM GAS OR LIQUID

Tube Position: Horizontal

Fluid Movement: Streamline Flow. Turbulent Flow.

Direction of Movement: Parallel to tube.

Data relating to the cooling of a gas or liquid on the outside of a horizontal tube in those cases in which the liquid is flowing parallel to the length of the tube are quite meager. The situation which prevails in most part is that of concentric pipes between which the fluid being cooled is circulated.

In this case the situation is similar to that encountered in the cooling of a fluid inside a horizontal tube and the appropriate equationsfor this calculation are, with one modification, probably satisfactory. In the equation pertaining to the inside of the tube, the term D must be replaced by D_e, the equivalent diameter. (see sections F 1 & 2).

$$D_e = \frac{D_2^2 - D_1^2}{D_1}$$

In order to test the conditions of flow, the Reynolds number should be calculated using an equivalent diameter $D_e' = D_2 - D_1$.

TERMINOLOGY:

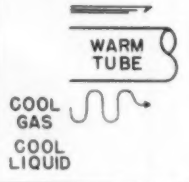
- D - Inside diameter of tube, ft.
- D_e - Equivalent diameter for heat transfer, ft.
- D_e' - Equivalent diameter for fluid flow, ft.
- D_1 - Outside diameter of smaller concentric tube, (inside of annulus) ft.
- D_2 - Inside diameter of larger concentric tube, (outside of annulus) ft.

REFERENCES:

1. Process Heat Transfer, D. Q. Kern, p. 105.
2. Heat Transmission, William H. McAdams, p. 248.

F 1 and 2

COEFFICIENT of HEAT TRANSFER through FILM between OUTSIDE SURFACE of a WARM TUBE and a COOL GAS OR LIQUID



Tube Position: Horizontal

Fluid Movement: Streamline Flow. Turbulent Flow.

Direction of Movement: Parallel to tube.

Data relating to the heating of a gas or liquid on the outside of a horizontal tube in those cases in which the liquid is flowing parallel to the length of the tube are quite meager. The situation which prevails in most part is that of concentric pipes between which the fluid being heated is circulated.

In this case the situation is similar to that encountered in the heating of a fluid inside a horizontal tube and the appropriate equationsfor this calculation are, with one modification, probably satisfactory. In the equation pertaining to the inside of the tube, the term D must be replaced by D_e, the equivalent diameter. (see sections F 4 & 5).

$$D_e = \frac{D_2^2 - D_1^2}{D_1}$$

In order to test the conditions of flow, the Reynolds number should be calculated using an equivalent diameter $D_e' = D_2 - D_1$.

TERMINOLOGY:

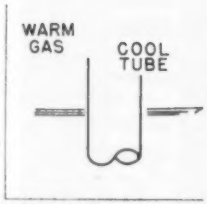
- D - Inside diameter of tube, ft.
- D_e - Equivalent diameter for heat transfer, ft.
- D_e' - Equivalent diameter for fluid flow, ft.
- D_1 - Outside diameter of smaller concentric tube, (inside of annulus) ft.
- D_2 - Inside diameter of larger concentric tube, (outside of annulus) ft.

REFERENCES:

1. Process Heat Transfer, D. Q. Kern, p. 105.
2. Heat Transmission, William H. McAdams, p. 248.

F 4 and 5

COEFFICIENT of HEAT TRANSFER through FILM between OUTSIDE SURFACE of a COOL TUBE and WARM GAS



Tube Position: Vertical

Gas Movement: Streamline Flow

Direction of Movement: Normal to tube.

EQUATION:

$$h_f = \frac{k}{D_o}\left[0.35 + 0.47\left[\frac{D_o V \rho}{\mu}\right]^{0.52}\right]\left[\frac{C\mu}{k}\right]^{0.3}$$

TERMINOLOGY:

- h_f - Film coefficient of heat transfer, BTU/hr. sq. ft. $^{\circ}F.$
- k - Thermal conductivity of gas at t_f, BTU/hr. ft.^{2} $^{\circ}F./ft.$
- D_o - Outside diameter of tube, ft.
- V - Velocity through minimum free area, ft./hr.
- ρ - Density of the gas at t_f, lb./cu. ft.
- μ - Viscosity of gas at t_f, lb./ft. hr.
- C - Specific heat of gas at constant pressure, BTU/lb. $^{\circ}F.$
- t_f - Relates to film temperatures. $t_f = t_s - .5\,(t_s - t_b)$.
- t_s - Temperature of surface of tube, $^{\circ}F.$
- t_b - Temperature of bulk of fluid, $^{\circ}F.$

LIMITATIONS:

To be used only when Reynold's number $(DV\rho/\mu)$ is between 0.1 and 1000.

SOURCES OF DATA:

For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

for ρ -- see pp. 130-146, 178-195, 1863.
μ -- see pp. 370-374, 1196, 1698.
k -- see pp. 459-461, 1303, 1697.
C -- see pp. 225-235, 297, 1686, 1696.

REFERENCES:

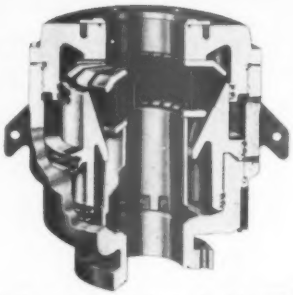
1. Chemical Engineers' Handbook, J. H. Perry, p. 473.
2. Heat Transmission, William H. McAdams, p. 222.
3. Applied Heat Transmission, H. J. Stoever, pp. 87, 90, 91 (1941).
4. J. Ulsamer, Forsch, Gebiete Ingenieurs, Vol., 3, p. 94 (1932).
5. H. Nether, Mitt. Forsch., Vol., 209, pp. 1-85, (1922).

F 1 b

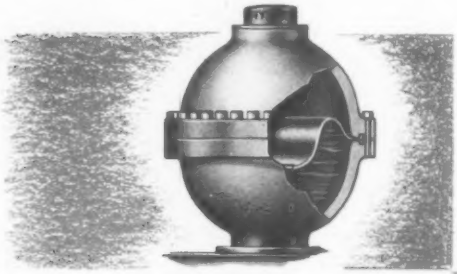
STOP BLOWOUTS INSTANTLY

with HYDRIL Positive Hydraulic Pressure!

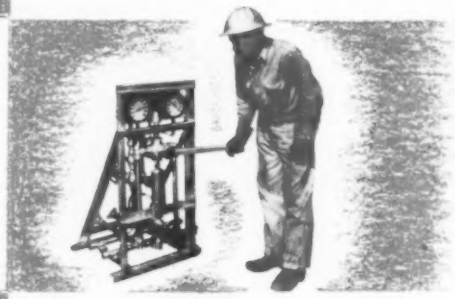
A single HYDRIL Automatic Pump Accumulator Unit maintains adequate pressure – instantly available – to operate your complete Blowout Preventer hookup. Here's how it works:



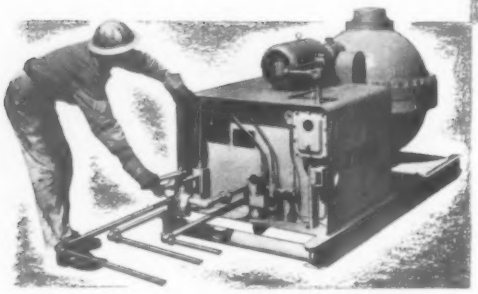
1 Hook up your single or double **HYDRIL "GK" BLOWOUT PREVENTER...**



2 to a **HYDRIL AUTOMATIC PUMP ACCUMULATOR UNIT** which stores hydraulic fluid under high pressure, keeping it always ready for instant closing of the Blowout Preventer...



3 then – in any emergency – pull a single lever at **DRILLER'S CONTROL STATION**



4 or at the **REMOTE CONTROL STATION** mounted on the Automatic Pump Accumulator Unit at a safe distance from the well. Controls are foolproof; regardless of which one is operated, the Blowout Preventer will always close...

***and* STRANGLE THE BLOWOUT *at the* START!**

HYDRIL COMPANY

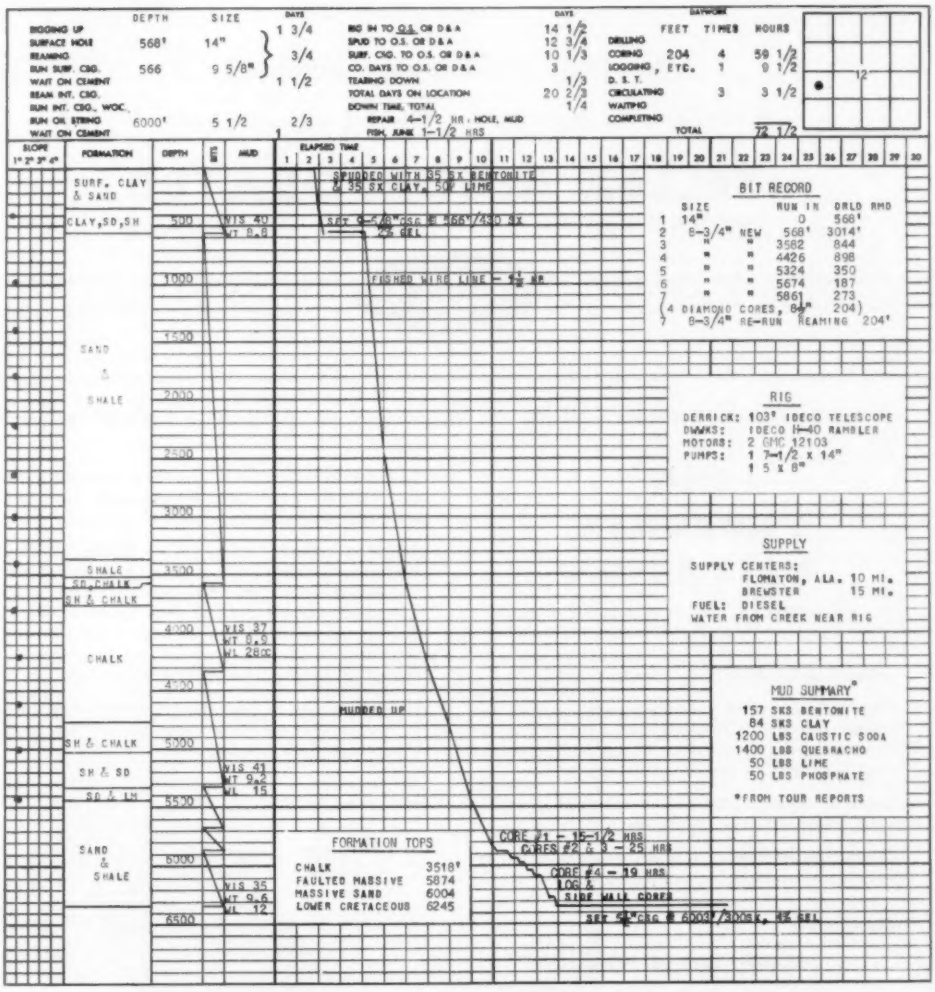
General Offices: 714 W. Olympic Blvd., Los Angeles 15, Calif.
Factories at Houston, Texas; Youngstown, Ohio; Rochester, Pa.

Call or write the nearest Hydril Sales Office:

CALIFORNIA: Avenal, Bakersfield, Los Angeles, Ventura; **LOUISIANA:** Harvey, New Iberia; **OHIO:** Youngstown; **OKLAHOMA:** Tulsa; **PENNSYLVANIA:** Rochester; **TEXAS:** Corpus Christi, Dallas, Houston, Midland, Odessa; **WYOMING:** Casper; **CANADA:** Calgary

New Alabama Drill Log

Contractor: Sunnyland Drilling Co.
Operator: Stanolind Oil & Gas Co.
Well: 1 Gray Unit.
Location: Section 12-1n-8e, Pollard Pool, Escambia County, Alabama.



(Compiled for The Oil and Gas Journal by Drilling Data Service, Oklahoma City)

Mapping Sub Surface Faults, Salt Domes and Structures
Local or County Wide

Surveying Tectonic Fault Trends, County or State Wide In Texas, Oklahoma and Louisiana

Predetermining "Hot Spots" on Pipe Line Rights of Way and Accurately Locating Spots on Lines Already Laid, Where Electrolysis Is Liable to Occur

New Accurate Processes and Instruments

Consultation Solicited and Discussions Are Welcome

TELLEX INCORPORATED

2609 Sunset Boulevard **Houston 5, Texas**

GEOPHYSICAL EXPLORATION TELLEX INC. PIPELINE CORROSION SURVEYS

"an outstanding contribution to the art of oil property valuation" —

OIL PROPERTY VALUATION

by PAUL PAINE, a consulting engineer with many years' experience in the oil production business

— because it covers such subjects as:

Oil properties and oil property interests . . . with definitions, examples, lists of required data, and a useful table giving the products of customary fractions used in dividing oil-property interests.

Unproved lands . . . including measures of value, the lease, selection rights, royalty, etc.

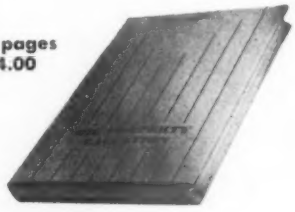
Oil and gas reserves . . . with definitions of terms, descriptions of methods . . . and all the working details.

Elements in valuation . . . including marketing; the gas; costs for acquisition, development, operations, taxes and overhead; and many other topics.

Valuation methods . . . explains the classic "engineering method" in detail with excellent examples of data compilations; describes other methods based on the time to pay out, the average daily barrels of oil production, the well itself, and the barrels in the ground; remarks on valuation compiled for the lender of money, on royalties, and on fair market value.

The examination and report . . . gives practical directions on how to go about a job, the examination of accounts, and the preparation of a report.

204 pages
$4.00



For sale by

READER SERVICE DEPARTMENT

THE OIL AND GAS JOURNAL

BOX 1260 • TULSA, OKLA.

by Thomas M. Newell*

How Inhibitors Prevent Corrosion in Oil Wells—3

MATERIALS adsorb on surfaces by two mechanisms, physical adsorption and chemisorption. Physical adsorptive forces can be likened to the forces of magnetic attraction. A good inhibitor adsorbs tenaciously to the steel surfaces forming the wall of the producing string.

Chemisorption . . . However, there exists a type of adsorptive force different from and more powerful than the strongest of the physical-adsorption forces discussed previously. This type is known as "chemisorption." Here, an inhibitor molecule possesses a complex electric force field of such a nature and power that the polar portion of the molecule can actually combine chemically through secondary valences with an atom of iron in a steel surface. These secondary valences are such that the atom of iron is not weakened in the slightest in its function as part of the structural steel.

It has long been realized that such a phenomenon is theoretically possible, and very recently, much intensive research to develop a corrosion inhibitor which possesses chemisorptive powers has been initiated. These tests have been successful. Adsorption and desorption tests indicate that the bonding force to steel is above that possible through action of physical forces.

The long hydrocarbon chains on inhibitor molecules serve a vital function in improving the performance of an inhibitor. These so-called hydrophobic (water-repelling) chains are "soluble" or compatible with oil and are not wetted by water. A finite film of oil is therefore "dissolved" on the film of adsorbed molecules, and though it is a transitory film, it is constantly replaced with produced oil. It is established that chains 12 to 18 carbon atoms in length are most effective.

Once a molecule of superior adsorptive force and of superior film-forming geometry has been discovered, its efficiency is still dependent upon the ability to wet steel of the fluid phase in which the inhibitor is dissolved.

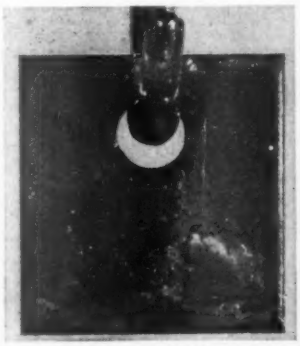
To clarify this statement, consider the use of an oil-soluble inhibitor in an oil well which produces a high ratio of water-to-oil, such as 100:1. Under such conditions, production may be in the form of globules of oil in brine, and contact of oil with the steel surfaces is infrequent. With the inhibitor present in the oil phase, infrequent contact of the oil (and therefore inhibitor) with steel necessarily means that most of the inhibitor will be produced out of the well without having the opportunity to adsorb. This is also true in a large percentage of wells which produce small ratios of water to oil, for many oil-well brines wet steel preferentially over the oil produced, as pointed out by Rogers and Waldrip.

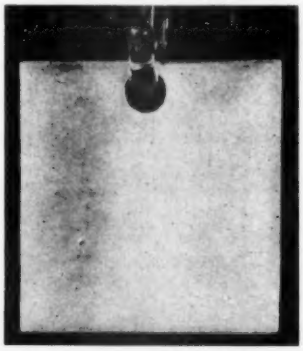
Wetting ability . . . The manner in which to increase the efficiency of the inhibitor, or to increase the contact time between inhibitor-bearing oil and steel is obvious; that is, incorporate in the bulk inhibitor chemicals which will impart to the oil powerful wetting ability. This can be done so that in most wells, the treated oil will displace brine to form a continuous unbroken film of oil on steel. This is true even in wells of high water-to-oil ratio, for when a globule of inhibitor-treated oil collides with a steel surface, it spreads quickly over the steel, displacing water, and within seconds an inhibitor film is adsorbed which then maintains the steel oil-wet and corrosionproof for a long period of time.

Efficient inhibitors . . . Our laboratories have concluded that oil-soluble first, and oil-soluble water-dispersible inhibitors secondly, are more efficient than water-soluble inhibitors. These conclusions are based upon studies of commercial inhibitors of each class, and upon investigation of numerous experimental compounds of each class. One factor may be that water-soluble inhibitors also contain one or more hydrophobic groups in addition to a polar group in each molecule.

Once a surface possesses an adsorbed inhibitor film, the protruding hydrophobic tails on the adsorbed molecules themselves "repel" the water phase which contains additional film-mending inhibitor, so that contact of fresh inhibitor with steel is inhibited just as is contact of the corrosive agents in the brine. With oil-soluble inhibitors, that film which is partially desorbed, or eroded away, is still preferentially oil-wet, and fresh oil containing additional inhibitor molecules is miscible with the remaining adsorbed film to give film-repairing polar molecules easy access to the spots where they are needed.

*Director of research, Cardinal Chemical Co.





Static tests are made to test film life of inhibitors. Fig. 1, left, is a photo of an unprotected coupon after 7 days in a corrosive brine solution. Fig. 2, right, is a coupon from the same test which was protected by 200 p.p.m. of inhibitor. Cardinal Chemical's Nocor inhibitor was used.

CROSE

PIPE CUTTING & BEVELING MACHINE

Gives you consistently uniform cuts under toughest field conditions. Unsurpassed in efficiency and economy. Full Circle Traveling Ring eliminates jerky movement. Insures cuts so smooth that buffing costs are negligible. Machines accommodating up to 14" pipe are equipped with standard type torch holder. Machines accommodating 16" pipe and larger are equipped with out-of-round attachment that allows the cutting flame of the torch to follow the surface contour of the pipe.

M. J. CROSE MANUFACTURING COMPANY, INC.

TULSA, OKLA.

2715 Dawson Road • Phone 6-2172

Pipe-Line Construction

PIPE-LINE activity as reported below by The Oil and Gas Journal is compiled from information received from pipe-line companies and contracting firms.

These projects include those planned, proposed, under way, and contracted. Uncontracted projects are indicated by a • preceding the company name.

Crude-Oil Pipe Lines

• **California-Oregon Pipe Line System**—103 miles, 6-in., proposed, Crescent City, Calif., to Medford, Oregon.

• **Cities Service Pipe Line Co.**—64 miles, 18-in., planned, Sour Lake, Tex., to Lake Charles, La. Completion date April 1953.

• **Cooperative Refinery Association.**—48 miles, 6-in., planned, Phillipsburg, Kans., to Holdredge, Neb. Begin 3-53.

• **R. A. Goodall.**—45 miles, 6-in., planned, Little Beaver to Merino, Colo. (To connect with Sterling system).

• **Gulf Refining Co.**—55 miles, 10-in., planned, Bay Marchand to Plaquemines, La.

• **Humble Pipe Line Co.**—71 miles, 16-18-in., planned, East Texas to Louisiana-Texas border. (30 miles of 16-in., and 41 miles of 18-in.) Completion date 10-53.

• **Interstate Oil Pipe Line Co.**—22 miles, 18-in., planned, Texas to Shreveport, La.

68 miles, 16-in., planned, Raceland to Anchorage, La. Begin 5-53.

137.6 miles, 22-in., planned, Shreveport to Baton Rouge.

• **Mackinac Pipe Line Co., Inc.**—635 miles, 30-in., proposed, Superior, Wis., to Sarnia, Ontario, Canada.

Mackinac Pipe Line Co., Inc.—97 miles, 30-in., start 5-1, Cooks to St. Ignace, Mich.

• **Magnolia Pipe Line Co.**—29 miles, 8-in., planned, Midland County, Texas area.

47 miles, 4-6-8-in., planned, Nolley field, Andrews County to Magutex field, West Texas.

47 miles 16-in., under way, Arden Station in Irion County to Eldorado Station in Schleicher County, Texas. Vaughn & Taylor constructors. 2-53.

• **Pasotex Pipe Line Co.**—146 miles, 10-in., planned, Snyder to Wink, Tex.

• **Phillips Pipe Line Co.**—45 miles, 12-in., planned, Rancho system to Sweeny, Tex. 6-53.

• **Platte Pipe Line Co.**—93 miles, 12-14-in., planned, Catham station near Worland, Wyo., to Oregon basin, and Byron field.

• **Progress Pacific Pipeline Co.**—1,100 miles, 24-in., planned, Odessa, Tex., to Los Angeles Harbor, Calif.

• **Pure Transportation Co.**—45 miles, 8-in., planned, Kimball to Gurley, Neb.

Rancho Pipe Line System.—455 miles, 24-in., under way, McCamey to Houston, Tex. (Joint project with Sinclair Pipe Line Co., Pan American Pipe Line Co., Tidewater Pipe Line Co., Nantucket Pipe Line Co., Phillips Pipe Line Co., and Ashland Pipe Line Co., with Shell Pipe Line Corp. handling construction and operation.)

McCamey to Cedar Valley near Austin, Tex. Anderson Bros. Corp. A. Kilgore, spreadman at Austin, Tex.

(Segment 1)—Austin to Shell's Deer Park Refinery (Houston area). Oklahoma Pipe Line Constructors.

(Spread 1)—Pasadena west to Cedar Valley and Austin, Tex. Houston Contracting Co. 3-1-53.

• **Roosevelt Oil & Refining Corp.**—22 miles, 4 and 6-in., planned St. Helens to Norwich, Mich.

• **Service Pipe Line Co.**—185 miles, 16-in., planned, Bowie, Tex., to Drumright, Okla.

30 miles, 6-in., Knox and Haskell counties, Texas.

29 miles, 4-6-8-in., proposed, Natrona County, Wyoming.

170 miles, 12-in., proposed, Tioga to Williston, N. D.

41 miles, 4-6-8-in., planned, Williams and Mountrail counties, North Dakota.

• **Texas-New Mexico Pipe Line Co.**—48 miles, 8-in., planned, from Lovington, N. M.

Texas Pipe Line Co.—34 miles, 6-in., under way, Sour Lake to Port Arthur, Tex. Houston Contracting.

• **West Coast Pipeline Co.**—960 miles, 20-22-in., planned, Midland, Tex., to Norwalk, Calif.

Products Pipe Lines

H. W. Bass & Sons., Inc.—152 miles, 4-6-in., proposed, Duval and Live Oak counties, Texas, to Corpus Christi, Tex.

• **Bell Oil & Gas Co.**—150 miles, 6-8-in., planned, Ardmore to Drumright, Okla. Completion date 6-1-53.

Buckeye Pipe Line Co.—370 miles, 10-14-16-in., under way, Linden, N. J., via Allentown, Pa., to Auburn, Syracuse, Waterloo, and Rochester, N. Y.

Contracted, Allentown, Pa., to Auburn, N. Y. Completion date 10-53.

Contracted, Auburn to Syracuse, N. Y. Completion date 10-53.

Contracted, Syracuse to Caledonia, N. Y. 10-53.

• **Coastal Products Pipe Line Co.**—260 miles, 20-in., proposed, Houston to Baton Rouge.

• **Continental Pipe Line Co.**—(Yellowstone Line)—600 miles, 8-in., planned, Billings, Mont., to Spokane, Wash.

• **Harbor Products Systems**—86 miles, 16-in., planned, Woodbury Junction, Philadelphia to Trembley Point, N. J. (Joint ownership of Sinclair Pipe Line Co., Gulf Oil Corp., and Texas Co.)

Indiana Farm Bureau Cooperative Association, Inc.—180 miles, 8-in., under way, Mt. Vernon to Indianapolis, Ind. R. B. Potashnick, contractor.

70 miles, 4-in., under way, Indianapolis to Peru, Ind. R. B. Potashnick, contractor.

Inland Empire Pipe Line Co.—504 miles, 10-in., proposed, Billings, Mont., to Spokane, Wash.

• **Phillips Petroleum Co.**—54 miles, 6-in., planned, Goldsmith to Borger, Tex.

52 miles, 10-in., planned, Shell's Brookshire system to Sweeny, Tex. 5-53.

• **Plantation Pipe Line Co.**—82 miles, 14-in., planned, Charlotte to Greensboro, N. C.

Salt Lake Pipe Line Co.—140 miles, 8-in., Pasco to Spokane, Wash. Completion date 6-53.

Sinclair Pipe Line Co.—85 miles, 12-in., under way, Sinco to Port Arthur, Tex. Completion date 3-53.

Standard Oil Co. (Ind.).—316 miles, 12-in., under way, Sugar Creek refinery to Dubuque, Iowa.

Under way, Polo, Mo., to Unionville, Mo. Sheehand Construction Co.

Under way, Unionville, Mo., to Dubuque, Ia. O. R. Burden Const. Corp.

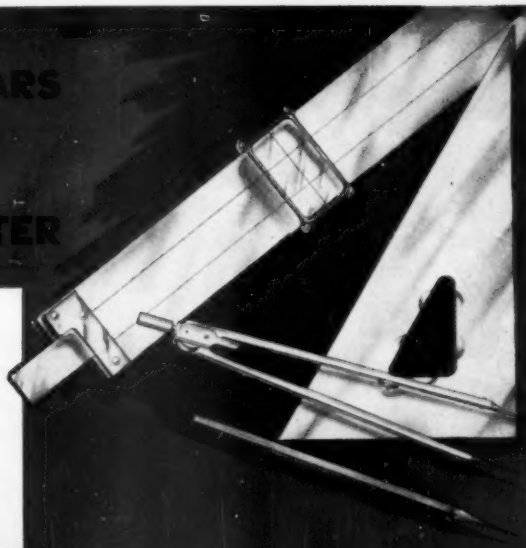
Planned, Mandan, N. D., to Moorhead, Minn.

• **Standard Oil Co. (Ind.).**—243 miles, 10-

THROUGH THE YEARS

HAPPY

SERVES YOU BETTER



by building larger and better staffs of experienced cooling and production engineers specializing in your problems.

Your nearest Happy man will be of even more value to you in '53 since many of the problems discussed and solved are yours !

The HAPPY *Company*

Seminole, Okla. • Tulsa, Okla. • Pampa, Texas
Odessa, Texas • Salem, Illinois • Ellinwood, Kansas
Dallas, Texas • Wichita Falls, Texas • Kilgore, Texas
Wichita, Kansas

TULSA, OKLAHOMA

Okadee
"THE PERFECT SEAL"
WRING FIT

No magic . . . No magnetism . . . lapped wring fit of every Okadee Valve disc and seat must pass this test of a perfect sealing surface. (unretouched photo)

. . . Here's What it Means to You in Terms of Valve Service

Flat mating surfaces within .000005", or less, of every set of Okadee valve discs and seats mean absolute shut-off of any material from ammonia gas to asphalt.

How long does this seal last in service? We honestly don't know. Tests under working conditions with propane were stopped after 269,000 operating cycles when no wear or seal failure could be detected. And Okadee valves do not have to be babied in service on corrosive or abrasive materials . . . Thousands of boilers have had Okadee blow-down valves in continuous, trouble-free service for fifteen years or more. If Okadee size-pressure-temperature ranges include your valve applications, Okadee installation will end your problems of valve performance once and for all.

Okadee valves are available in single-disc (one direction) and double-disc (two directions) types; screwed or flanged; ½" to 6" in standard A.S.A. dimensions; steel or semi-steel bodies (other materials to order); stainless steel or stellite seat facings; levers, rack-and-lever, worm-gear, hydraulic, pneumatic, automatic on-off control.

Write for Bulletin 332-C today!

OKd. Okadee COMPANY
332 South Michigan Avenue • Chicago 4, Illinois

12-in., proposed, Whiting, Ind., to River Rouge, Mich.

Sun Pipe Line Co.—110 miles, 8-in., under way, Fostoria to Hudson, Ohio.

• **Texas Pipe Line Co.** (Evangeline Products Systems)—196 miles, 16-in., planned, Port Arthur, Tex., to Baton Rouge, La.

Texas Pipe Line Co.—29 miles, under way, Fuller Ranch gasoline plant to Basin Pipe Line System, West Texas. Holder Const. Co.

• **United States Pipe Line Co.**—1,799 miles, 22-26-in., proposed, Beaumont, Tex., to Newark, N. J.

Beaumont, Tex., to Memphis, Tenn.
Memphis, Tenn., to Louisville, Ky.
Louisville, Ky., to Newark, N. J.
Laterals to Paducah and Lexington, Ky.

• **Wolverine Pipe Line System**—200 miles, 14-in., planned, Chicago to Toledo and Detroit. (Joint ownership of Shell, Texas, and Cities Service).

Natural-Gas Pipe Lines

• **Allied Gas Co.**—24 miles, 6⅝-in., proposed, McLean to Champaign County, Illinois.

• **Arkansas-Missouri Power Co.**—140 miles, 2 to 10-in., planned, St. Francis River, Clay County, Arkansas, to near Campbell, Mo.

• **Associated Natural Gas Co.**—88 miles, Missouri.

• **Carolina Natural Gas Corp.**—185 miles, 2-12-in., proposed, lateral lines off Transcontinental in North and South Carolina.

• **Chattahoochee Natural Gas Co.**—70 miles, proposed, Floyd County, Georgia, to Dalton, Ga.

• **Chicago District Pipe Line Co.**—35 miles, 24-30-in., proposed, Chicago area.

Cities Service Gas Co.—21 miles, 26-in., planned, Franklin and Anderson counties, Kansas.

15 miles, 20-in., Craig County, Oklahoma, to Lawrence County, Missouri.

• **Coast Counties Gas & Electric Co.**—40 miles, 3, 4, and 8-in., planned, Coast and Valley region, California.

Colorado Interstate Gas Co.—250 miles, 20-in., under way, Kit Carson, Colo., to Amarillo, Tex. R. H. Fulton & Co., contractor.

Pueblo County to Fowler, Colo.

• **Cumberland and Allegheny Gas Co.**—31 miles, 12-in., proposed, Garrett County, Md., to Keyser, W. Va.

• **East Tennessee Natural Gas Co.**—158 miles, 16-in., planned, Knoxville to Kingsport, Tenn. (58 miles of laterals.) 11-53.

• **El Paso Natural Gas Co.**—1,778 miles, proposed, Permian basin, New Mexico, Texas, and Colorado.

• **Glacier Gas Co.**—285 miles, 20-in., proposed, Kalispell, Mont., to Spokane, Wash.

120 miles, 16-in., proposed, Spokane to Hanford, Wash.

91 miles, 8⅝-in., proposed, Spokane to Lewiston, Idaho.

130 miles, 12¾-in., proposed, Spokane to International boundary at Trail, British Columbia.

• **Gulf Interstate Gas Co.**—860 miles, 30-in., proposed, Acadia Parish, La., to Boyd County, Ky.

329 miles, 12 to 24-in., proposed. Laterals off Acadia Parish, Louisiana, to Boyd County, Kentucky, line.

• **Home Gas Co.**—32 miles, 12-in., planned, Breesport to Union Center, N. Y.

17 miles, 12-in., proposed, loops from Hansock to Sanford, N. M.

46 miles, 12-in., under way, Tioga and Broome counties, New York. H. L. Gentry Const.

22 miles, 12-16-in., under way, Binghampton, N. Y.

• **Hope Natural Gas Co.**—33 miles, 8-10-12-in., planned, Wyoming County, West Vir-

WALKER CENTRIFUGE MACHINE

More

COMPACT

The compact, streamlined Walker Centrifuge Machine fits snug into your car—makes gauging simple and handy. It measures accurately the BS and water content of crude oil. Requires minimum maintenance because a direct drive to the tube head eliminates unnecessary bearings which before were subject to dirt. Aluminum casting construction makes it light, rugged, spark resistant. Speed adjustable up to 2450 RPM (required ASTM speed, 1750). Six volts and five and one-half amps make it easy on the car battery.

Everything the Gauger Needs From One Dependable Source

- WALKER OIL THIEF
- GAUGING TAPES
- SAMPLE HEATERS
- STRAPPING KITS
- CARRYING CASES

See our Exhibit, Tulsa Oil Show—
May 14 to 23, 1953
Booth at entrance — Scientific and Technical Building on Arcade Way.

W. L. Walker Co.
Phone 2-1148
1009 So. Main Tulsa, Oklahoma

SHORTSTIR* MIXERS

for Pipe Line, Process and Refinery fluid agitation

Uniquely designed for . . . Years of trouble-free operation • Minimum wearing parts • Maintenance accessibility • Compactness • Application flexibility • Operational safety. Combining these important features, SHORTSTIR Mixers have proved themselves in many different Oil Industry applications. To solve your mixing problems — install a SHORTSTIR.

*The original SHORTSTER Mixer, designed and manufactured by . . .

Write for Literature

SJR Sawyer-Jensen-Ross Co.
BOX 3136 WHITTIER STATION TULSA 4, OKLAHOMA

Send for descriptive bulletin CT-102

EXCEL-SO CALIBRATING TANKS

for
REFINERIES
TERMINALS
PIPE LINES
TANK TRUCKS
LOADING RACKS
PUBLIC SEALERS

We have built hundreds of these provers in all capacities from 50 gallons to 50 barrels. This experience enables us to deliver a REAL PRECISION INSTRUMENT that is Guaranteed. Building, calibrating and guaranteeing a calibrating tank is specialized, painstaking work and is definitely "out" of the price-per-pound category. These tanks are designed to conform to the A.P.I. tentative code #1101, but may be furnished with such modifications as you, the customer, may require.

WARNER LEWIS COMPANY
BOX 3096 • TULSA, OKLAHOMA

"PIPELIFE"

CLEANS AND PLASTIC COATS LINES INTERNALLY IN PLACE

NOTICE

Increasing demand for Pipelife necessitates national expansion. A limited number of exclusive territories are open to qualified prospective licensees. Call or write Pipelife, Inc., Box 1711, phone 6-3774, Odessa, Texas.

Reclaim old pipe — protect new pipe with PIPELIFE! Here is a field proven, patented method of cleaning and plastic-coating oil, water, gas or product lines internally *in place*, without damage to pipe or right of way. Up to 10 miles of line can be processed at one time. PIPELIFE features are: Old condemned lines which are badly deteriorated from internal corrosion, can be restored to better than their original efficiency. Eliminates internal corrosion — stops paraffin build-up and scale depositions — stops leaks — and is economical to use. In highly corrosive areas, the cost of applying this process is only 1/5 the cost of maintaining an uncoated new line for a 5-year period.

BEFORE

AFTER

POSITIVE PIPELINE PROTECTION

The PIPELIFE process offers positive protection for both old and new lines. Pipelines, in areas where internal corrosive elements limit their life expectancy to approximately three years, can be protected for almost unlimited years of service with PIPELIFE protection. Up to 10 miles of line can be cleaned and plastic coated internally, in place (underground), without damage to pipe or right-of-way. To date, OVER A MILLION FEET of line have been PIPELIFE processed. This represents a definite trend by companies to conserve lines in the face of pipe shortage.

LONG LIFE FOR NEW LINES

No line is too difficult to clean and process the PIPELIFE way. Above are actual photos of a 6-inch vacuum gas line, located in New Castle, Wyoming, before and after being cleaned and plastic coated (in place) by PIPELIFE, INC., Odessa, Texas. Write or phone today for a free folder explaining the process in detail.

PAYS BIG DIVIDENDS
INTERNAL PIPELINE MAINTENANCE

PIPELINES CLEANED AND PLASTIC COATED INTERNALLY — IN PLACE

PIPELIFE, INC.

BOX 1711 ODESSA, TEXAS 1604 W. 2ND

ginia, south to Buchanan County, Virginia.

• **Interstate Power Co.**—26 miles, 8-in., proposed, from Nat. Gas P. L. Co. America line near Hooppole, Ill., to Clinton, Ia.

Iowa-Illinois Gas & Electric Co.—41 miles, 10-in., planned, Washington County to Cedar Rapids, Iowa.

• **Kansas-Nebraska Natural Gas Co., Inc.**—179 miles, planned, Kansas and Nebraska.

54 miles, 4-6-in., planned, Neligh to Hartington, Neb. Completion date 1953.

42 miles, 4-6-in., planned, Neligh to O'Neal, Neb. 9-53.

196 miles, proposed, Kansas and Nebraska.

Kansas Nebraska Natural Gas Co.—70 miles, 6-8-in., under way, Nebraska City to Denver-Julesburg basin, Colo.

• **Lone Star Gas Co.**—100 miles, proposed, storage fields to the Dallas-Fort Worth area.

35 miles, 12-in., proposed, southeastern Schleicher County.

• **Manufacturers Gas Light & Heat Co.**—40 miles, proposed, Allegheny, Washington, and Beaver counties, Pennsylvania.

213 miles, 3 to 26-in., proposed, various points on system in Pennsylvania, West Virginia, and Ohio.

• **Michigan Gas Storage Co.**—30 miles, 26-in., planned, Lainsburg Junction north. 7-53.

• **Midsouth Gas Co.**—191 miles, planned, Helena to Palestine, Ark.

• **Mississippi River Fuel Corp.**—109 miles, 10-18-in., planned, laterals in Woodlawn and Waskom gas fields, Texas.

Missouri Central Gas Co.—25 miles, 6-in., contracted, Moberly to Macon, Mo. L. R. Young Const. Co.

• **Missouri Public Service Co.**—136 miles, 8-10-in., proposed, New Franklin to Trenton, Mo.

• **Montana Power Co.**—52 miles, 16-in., planned, Canada - Montana border to Cut Bank, Mont.

• **Morganfield Natural Gas Co.**—31 miles, 4-6-in., planned, through Sturgis, Providence, Clay, Diamond, Wheatcroft, and Sullivan, Ky.

• **Natural Gas Producers Inc.**—100 miles, 12-in., planned, Yenter pool to Denver, Colo.

• **Nevada Natural Gas Pipe Line Co.**—114 miles, 12¾-in., proposed, Topock, Ariz., to Las Vegas, Nev.

• **New River Gas Co.**—50 miles, planned, Summers to Monroe counties, West Virginia, to Narrows and Dublin, W. Va.

• **New York State Electric and Gas Co.**—59 miles, 8-10-24-in., proposed, Oneonta and Norwich to DeRuyter, N. Y.

New York State Natural Gas Corp.—104 miles, 14, 16, 20-in., under way, looping on Westmoreland, Armstrong, and Tioga counties, Pennsylvania. (Includes 17 miles, 16-in., in Potter County, Pennsylvania, and 21 miles 14-in., replacement in Line No. 507, New York.)

Utica to Amsterdam, N. Y. (to begin at completion of Zelienople). Williams-Austin. Howard Bauer, superintendent. Completion in 90 days.

Angelica to Rossburg, N. Y. (begin at completion of Cayuta-Ithaca). Williams-Austin. Howard Bauer, superintendent. Completion in 45 days.

Colesburg Junction to Sabinsville, Pa. (begin at completion of Angelica job), Williams-Austin. Howard Bauer, superintendent.

21 miles, Columbiana and Stark counties, Ohio.

• **New York State Natural Gas Co.**—95 miles, 16-20-in., planned, Clinton County to Armstrong County, Pennsylvania.

(Section 1) 16-in., Clinton County, Pennsylvania.

(Section 2) 20-in., Armstrong County, Pennsylvania, begin 1953.

Niagara Mohawk Power Corp.—55 miles,

"We use CLEVELANDS almost exclusively for the simple reason that they are the most economical trenchers we have ever used."

R. H. Fulton & Company

LUBBOCK, TEXAS

The constant flow of repeat orders for CLEVELAND trenchers—for all types of trenching work—is first hand evidence that thousands of users throughout the world are in wholehearted agreement with R. H. Fulton & Company's tribute to CLEVELANDS.

Get the full story on CLEVELANDS from your local distributor

THE CLEVELAND TRENCHER CO.

Pioneer of the Modern Trencher

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

10-in., begin 4-1-53, Watertown to Syracuse, New York. Williams-Austin Co.

• **Northern Indiana Fuel & Light Co.**—33 miles, 8-in., proposed, Edgerton to Auburn, Ind.

• **Northern Natural Gas Co.**—580 miles, proposed, Kansas, Texas, Oklahoma, and Nebraska loops.

210 miles, 26-in., planned, five loops in Texas-Oklahoma area, two in Kansas, and two in Nebraska.

400 miles, 24-in., proposed, Emerson, Manitoba south to Red River Valley through Fergus Falls on to St. Paul, Minn.

102 miles, planned, extension.

Northern Natural Gas Co.—140 miles, 4-6-8-in., under way, south of Rolla, Kans., to Guymon, Okla. Reese Bros. Const. Co. E. H. Reese, spreadman at Hugoton, Kans.

• **Northwest Natural Gas Co.**—750 miles, planned, Washington, Oregon, and Idaho.

24-in., Eastport, Idaho, to Monroe, Wash.

18-in., Monroe to International boundary near Lynden, Wash.

22-in., Monroe to near Seattle, Wash.

20-in., Seattle to Portland, Ore.

• **Ohio Fuel Gas Co.**—31 miles, 20-in., planned, Licking County to Richland County, Ohio.

22 miles, 16-in., planned, Dayton, Troy, Piqua, and Sidney, Ohio.

23 miles, 16-20-in., planned, Wellington to Elyria, Ohio; 16 miles, 20-in., planned, Benton Station to Crawford Station; 18 miles, 20-in., Crawford Station to near Columbus; 16 miles, 16-in., planned, Berlin to Sandusky, Ohio.

74 miles, 3 to 20-in., planned, Hocking, Knox, and Ashland counties, Ohio.

47 miles, 20-in., planned, Benton Township, Hocking County, to Columbus, Ohio.

61 miles, planned, northern and southwestern Ohio.

33 miles, 20-in., proposed, Jefferson to Seneca, Ohio.

Oklahoma Natural Gas Co.—50 miles, 10-in., contracted, Sapulpa to Choteau, Okla. 6-53.

• **Pacific Gas & Electric Co.**—50 miles, 12-16-20-in., planned, Fresno to Merced, Calif.

(Section 1) 16-in., Burrel to near Easton, Calif.

(Section 2) 20-in., Holm to Topock-Milpitas line.

(Section 3) 12-in., parallel existing Madera-Livingston line, planned, Monterey to Fort Ord to Castroville; Napa Wye to Shellville; Cotati to Santa Rosa, Calif.

170 miles, 34-in., proposed, main-line loops along Topock, Ariz., to Milpitas, Calif.

Pacific Gas & Electric Co.—141 miles, 34-in., under way, parallel sections along Topock-Milpitas line. Engineers Pipe Line, Ltd. Summer 1953.

• **Pacific Northwest Pipeline Corp.**—1,466 miles, proposed, Ignacio, Colo., to Bellingham, Wash.

380 miles, proposed, laterals and spurs off main line to Pocatello, Idaho, to Yakima, Wash.

Panhandle Eastern Pipe Line Co.—70 miles, 24-26-in., under way, looping from Sneed, Tex., to Emporia, Kans.

174 miles, 30 and 26-in., contracted. Tuscola, Ill., eastward—looping present system; R. A. Conyes, contractor.

26-in., Edgerton, Mich., Anderson Brothers.

30-in., looping in Tuscola, Ill.

30-in., looping in Montezuma, Ind.

30-in., looping in Zionsville, Ind.

• **Panhandle Eastern Pipe Line Co.**—23 miles, planned, Peoria County, Illinois.

• **Peoples Natural Gas Co.**—25 miles 6 to 24-in., planned, Cambria and Blair counties, Pennsylvania.

• **Permian Basin Pipeline Co. (Northern Natural)**—163 miles, 20-30-in., proposed, Permian basin and eastern New Mexico.

• **Phillips Petroleum Co.**—125 miles, 2 to 24-in., planned, Midland, Upton, Glasscock, and Reagan counties, Texas. Completion date 6-53.

28 miles, 10-in., planned, Bayou Plant to Adams Terminal. Completion date 7-53.

• **Public Service Co. of Colorado**—95 miles, proposed, Douglas Creek and other gas fields to Grand Junction, Colo., area.

• **Public Service Co. of North Carolina**—83 miles, 8-in., planned, Kings Mountain to Asheville, N. C. Completion date 3-1-53.

• **Rockland Light & Power Co.**—22 miles, 8-in., proposed, Orangetown to Tompkins Cove, N. Y.

• **Shenandoah Gas Co.**—39 miles, 3-4-8-in., proposed, Middleton, Va., to Martinsburg, W. Va.

• **South Carolina Natural Gas Co.**—160 miles, 16-12-10-in., proposed, Aiken, S. C., to cities of Columbia, Summerville, and Charleston, S. C.

• **South Georgia Natural Gas Co.**—339 miles, 2-12-in., planned, Phoenix, Ala., to Tallahassee, Fla. (a) 12-in., Phoenix, Ala., to Albany, Ga., (b) 10-in., Albany, Ga., to Moultrie, Ga., (c) 8-in., Moultrie, Ga., to Tallahassee.

• **Southern California Gas Co.**—35 miles, planned, Antelope Valley, California.

Southern California Gas Co. and Southern Counties Gas Co. of California—45 miles, 30-in., contracted, looping on line from Arizona border to Los Angeles. J. B. Gill.

81 miles, 30-in., contracted, Whitewater to Desert Center, Calif. J. B. Gill.

Contracted, looping between Blythe and Colorado River and on westward of Indio. J. B. Gill.

• **Southern California Gas Co., and Southern Counties Gas Co.**—73 miles, 30-in.,

Wherever you turn in a refinery you'll find a use for R/M VERSI-PAK®

When you have R/M versi-pak on hand you don't have to stock a large number of special packings. This all-round packing made by Raybestos-Manhattan works well on centrifugal, rotary and reciprocating equipment. It resists temperatures up to 350°F. and pressures up to 600 psi. It resists crude oil, gasoline, naphtha, steam, gas, and a long list of chemicals. Because versi-pak is easily compressed, you can "take up" on glands to compensate for wear. Streamline and simplify your packing inventory with versi-pak. Write us for samples and data, or call in your R/M distributor.

R/M K-68®... Neoprene and asbestos sheet | R/M Teflon® Valve Stem Packing ... For use against chemicals | R/M V-Square®... for oil-field mud pumps | R/M Teflon® Braided and Plastic Packing For use against chemicals

*Du Pont trade-mark for its tetrafluoroethylene resin

R/M

PACKINGS

RAYBESTOS-MANHATTAN, INC.

PACKING DIVISION, MANHEIM, PA.

FACTORIES: Bridgeport, Conn.; Manheim, Pa.; No. Charleston, S.C.; Passaic, N.J.; Crawfordsville, Ind.; Peterborough, Ontario, Canada

RAYBESTOS-MANHATTAN, INC., Manufacturers of Packings • Teflon Products • Asbestos Textiles • Industrial Rubber Products • Abrasive and Diamond Wheels • Rubber Covered Equipment • Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Sintered Metal Products • Bowling Balls

planned, loops on main line from Blythe to Los Angeles.

Southern Natural Gas Co.—1,235 miles, 24 to 4½-in., contracted, Louisiana, Mississippi, Alabama, and Georgia, and South Carolina. Houston Contracting and H. C. Price. Fall 1953.

Gwinville, Miss., to Franklinton Junction, La.

Lateral from Franklinton Junction, La., to Sand Hook field, Mississippi.

Franklinton Junction, La., to Duck Lake gas field, Louisiana.

Duck Lake gas field, Louisiana, to Lake Sand field, Louisiana.

• **Southern Union Gas Co.**—21 miles, 20-in., planned, Albuquerque, N. M.

30 miles, 12-20-in., contracted, San Juan County, New Mexico. R. H. Fulton & Co.

• **Southwest Gas Corp., Ltd.**—26 miles, proposed, from P.G.& E. line to Victorville, Calif.

• **Tennessee Gas Transmission Co.**—50 miles, 30-in., proposed, Sinton and El Campo, Tex.

• **Texas Eastern Transmission Corp.**—315 miles, 24-in., planned, Provident City, Tex., to Castor, La.

• **Texas Gas Transmission Corp.**—408 miles, 26-in., under way, looping from Bastrop, La., to Jefferson Town Station near Louisville, Ky. Houston Contr. and H. C. Price Co. Spring 1953.

• **Texas-Ohio Gas Co.**—1,435 miles, 30-in., proposed, Hidalgo County, Texas, through Arkansas, Mississippi, Tennessee, and Kentucky on to Spencer, W. Va. Completion date 6-30-53.

• **Trans-Northwest Gas, Inc.**—246 miles, proposed, International Boundary near Osoyoos, B. C., to Washington and Idaho.

275 miles, branch lines.

• **Union Oil Co. of California**—40 miles, 8-10-in., planned, San Joaquin Valley and Los Angeles Basin.

• **United Fuel Gas Co.**—50 miles, 20-24-in., proposed, Wood County to Lanham, W. Va.

• **United Gas Pipe Line Co.**—44 miles, 20-in., planned, Lirette field to Harvey, La.

• **United Natural Gas Co.**—50 miles, 12-in., planned, Elk County to Jefferson County, Pennsylvania.

• **Utah Natural Gas Co.**—96 miles, 16-18-in., proposed, Clear Creek field near Price to Salt Lake City, Utah.

18-in., Clear Creek to Provo, Utah.

16-in., Provo to Salt Lake City, Utah.

Virginia Natural Gas Co.—153 miles, Buckingham to Richmond and Portsmouth, Va.

Warren Petroleum Corp.—78 miles, 2-24-in., proposed, Lovington, N. M. Completion date 9-53.

Westcoast Transmission Co., Ltd.—(See foreign natural gas pipe lines).

• **Western Slope Gas Co.**—39 miles, 8-in., planned, Garmesa to West Douglas Creek, Colo. 10-1-53.

Western Slope Gas Co.—26 miles, 10-8-in., under way, Grand Junction to Garmesa, Colo. Foutz & Bursum Const. Co. 2-15-53.

• **Wilcox Trend Pipe Line Co.** (Harry Bass Drlg. Co.)—157 miles, 14-16-20-in., planned, gathering system for delivery to proposed Texas Eastern terminal at Provident City, Tex. (60 miles laterals.)

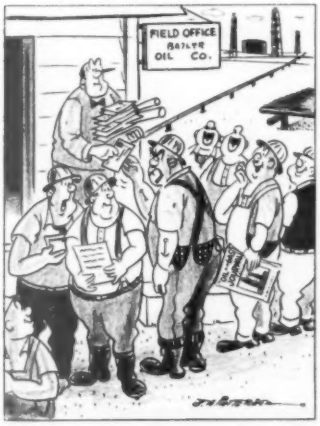
Foreign Crude-Oil Pipe Lines

Arabian American Oil Co.—16 miles, 12-in., under way, loops on Al Kobar, Saudi Arabia to Bahrein Island, submarine lines.

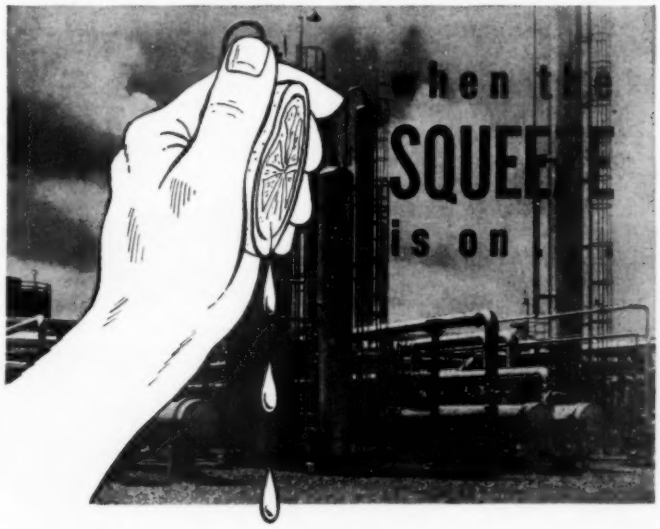
Basrah Petroleum Co.—72 miles, 24-in., under way, Zubair to Fao. Completion date May 1953.

• **Cia. de Petroleo Ganso Azul, Ltd.**—48 miles, 4-in., planned, Ganzo Azul field to Pucalpa on upper Ucayali River, Peru.

Creole Petroleum Corp.—143 miles, 26-in., under way, Ule (State of Zulia) to Amuay (State of Falcon). Williams Bros. de Venezuela, S.A., contractor of overland sections; general superintendent, Maracaibo. McWilliams, Gahagan, and Anderson Brothers, con-



"Why it couldn't be anybody but his mother!"



think of heat transfer equipment

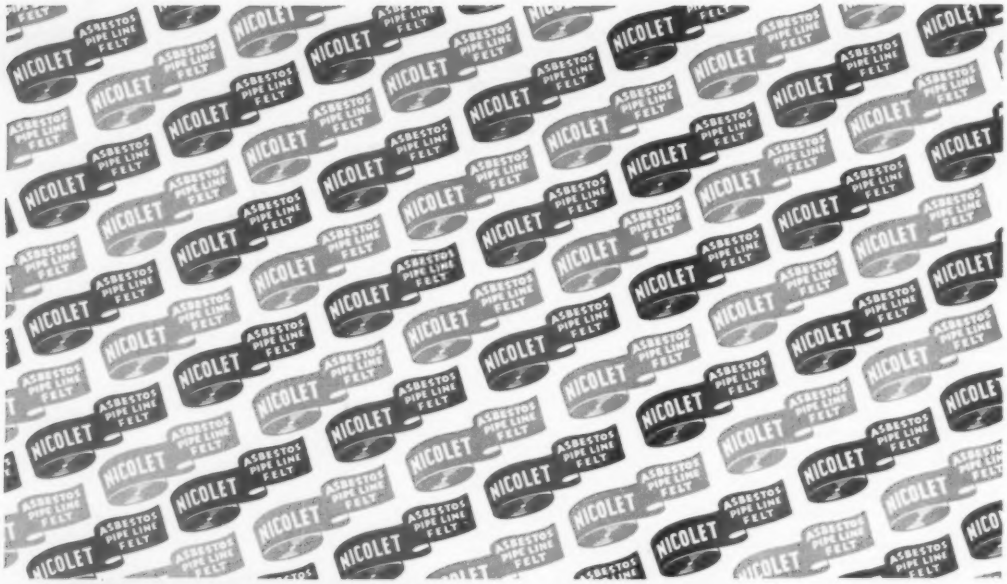
WESTERN

Naturally it's better to take care of a heat transfer problem before it becomes an emergency . . . but when the squeeze is on—call Western Supply Company. Their central location in Tulsa, Oklahoma . . . their experienced heat exchanger sizing and rating staff . . . their up-to-the-minute fabrication shops have pulled many a crucial job out of the fire, and sent heat transfer equipment on its way when time was short. For all your heat exchanger needs . . . Western Supply Company, a member of the Tubular Exchangers Manufacturers Association.

WESTERN HEAT EXCHANGERS

WESTERN SUPPLY CO.

P. O. BOX 1888 • TULSA, OKLAHOMA

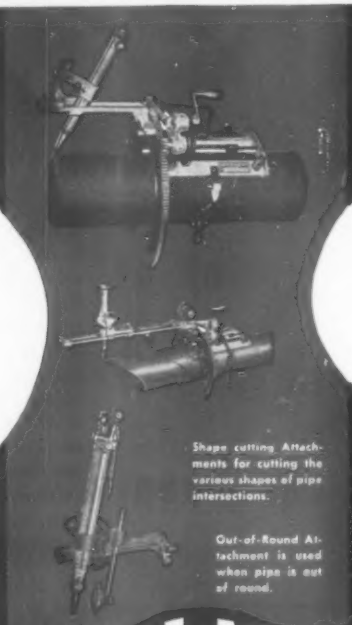


The Felt With a Future

MANUFACTURED BY:
NICOLET INDUSTRIES, INC.
70 Pine Street New York 5, N. Y.

DISTRIBUTED BY:
MIDDLE WEST COATING & SUPPLY
207-A Daniel Bldg. Tulsa, Okla.
P. O. Box 153 Ph. 2-5215 or 2-5216

For Easier, Faster, Pipe Cutting & Beveling



Shape cutting Attachments for cutting the various shapes of pipe intersections.

Out-of-Round Attachment is used when pipe is out of round.

Economical...

With the economical H&M you can save up to half of the time and labor in cutting and beveling pipe. This portable but durable machine makes a complete cut and bevel in a 12 inch pipe in about two minutes.

See for yourself. Let us arrange a demonstration.

H&M PIPE BEVELING MACHINE COMPANY
311 E. 3rd St. Tulsa, Okla.
Phone 3-0241

tractors of water crossings. Completion date March 1953.

• **Creole Petroleum Corp.**—25 miles, 34-in., planned, Lagunillas to La Salina (State of Zulia). Completion date April 1953.

Direccion General de Yacimientos Petroliferos Fiscales—409 miles, under way, Plaza Huincul to Bahia Blanca, Argentina.

Interprovincial Pipe Line Co.—135 miles, 24-in., looping from Regina to U. S. border.

• **National Iranian Oil Co.**—38 miles, 12-in., planned, Lali to Masjid-i-Sulaiman.

27 miles, 12-in., planned, Kut-Abdullah to Zergan.

• **Petroleos Mexicanos.**—145 miles, 12-in., considered, 18 de Marzo field via Reynosa to Monterrey, Mexico.

100 miles, planned, Isthmus of Tehuantepec, Jose Colomo to El Plan field, Minatitlan.

72 miles, 12-in., proposed, Poza Rica to Atzacapotzalco, Mexico.

Petroleos Mexicanos.—125 miles, 10-in., under way, Jose Colomo to El Plan, Mexico.

• **Saskatoon Pipe Line, Ltd.**—56 miles, 6-in., planned, Milden to Saskatoon, Sask.

Texas Petroleum Co.—60 miles, 4-6-in., under way, Pta. Nino to La Dorada.

• **Trans Mountain Oil Pipe Line Co.**—30 miles, planned, Vancouver, B. C., terminal to Ferndale, Wash.

Trans Mountain Oil Pipeline Co.—711 miles, 24-in., under way, Edmonton, Alta., to Vancouver, B. C. Canadian Bechtel, Ltd., engineers. Completion date 8-53.

Edmonton to Acheson, Canadian Pipe Line Const. 8-53.

Acheson to Blue River, B. C., Comstock Midwestern. 8-53.

Blue River, B. C., to Coquehalla, B. C., Mannix, Ltd. 8-53.

Coquehalla to Vancouver, B. C., Comstock Midwestern. 8-53.

• **Yacimientos Petroliferos Fiscales Bolivianos.**—170 miles, 4-in., planned, Bermejo to Tupiza, Bolivia.

Foreign Products Pipe Lines

Colombian Ministry of Petroleum. — 115 miles, 4-in., begin 1953, La Dorada to Cartago, Colombia, Williams Bros. Engineers.

93 miles, 8-in., begin 1953, Cantimpiora to Dorada, Colombia, William Bros. Constructors.

• **Empresa Nacional del Petroleo** — 80 miles, 6⅝-in., planned, Concon to Santiago, Chile.

Empresa de Ferrocarriles Ecuatorianos.—50 miles, 6-in., contracted, Guayaquil to Palmira, Ecuador. J. A. Jones, contractor; C.R.C. Engineering Co., engineers.

• **Governments of Southern Rhodesia and Portuguese East Africa.**—200 miles, considered, Beria, Portuguese Mozambique to Umtalia, Southern Rhodesia.

Societie des Petroles au Congo. (Sub Cie. Financiere Belge des Petroles, S.A.).—225 miles, 6-in., under way, Ango-Ango to Leopoldville, Belgian Congo. Completion date 2-53.

• **Petroleos Mexicanos.**—124 miles, 6-in., planned, Lagos to Guadalajara, Mexico.

54 miles, 6-in., planned, Lagos to Aguascalientes, Mexico.

82 miles, 8-in., planned, Salamanca to Lagos, Mexico.

• **Sun Pipe Line Co. of Canada.**—200 miles, 8-in., planned, Sarnia, Hamilton, Toronto, Ont.

• **United States Government.**—375 miles, planned, St. Nazaire to Melun and Metz, France.

Your WATE-KOTED pipe will probably never be subjected to this particular type of abuse, but loading, unloading and laying can exert a lot of strain on it. That's why all Rosson-Richards WATE-KOTED pipe is uniformly reinforced with Key Mesh Wire or Single Strand Wire to provide an adherent material almost as strong as the pipe itself.

WATE-KOTE is not only the heaviest weighting material of its type yet developed, but is tough enough to take a lot of punishment during laying operations. WATE-KOTE was developed by Rosson-Richards to lick the tough job of laying pipe through open water, rivers or marshy ground. The high strength and high-density of WATE-KOTE make it the ideal weighting material to keep pipe on bottom.

If your pipeline problem includes laying pipe through soft ground or water, WATE-KOTE is probably the answer. Rosson-Richards' engineers will be glad to show you how WATE-KOTE is the most practical, economical method of weighting pipe.

RR
THE
ROSSON-RICHARDS
COMPANIES
M&M BLDG. - HOUSTON, TEXAS

Houston • Corpus Christi • Harvey, La.
Charlotte, N. C. • Jackson, Miss.

Foreign Natural-Gas Pipe Lines

• **Azienda Generale Italiana Petroli.**—110 miles, 12-14-16-in., Start 11-52. Cortemaggiore to Genoa. Completion date 11-53.

Azienda Generale Italiana Petroli—90 miles, 12-in., under way, Cortemaggiore to Bologna, Italy, SNAM crews.

120 miles, 16-in., under way, Cremona Porto Mar to Ghera, Italy, Montubi, contractor.

40 miles, 12-in., under way, Ripalta-Bergamo, Italy.

Direccion General del Gas del Estado—310 miles, 8-in., under way, Plaza Huincul to Neuquen, Argentina, to the vicinity of General Conesa, Argentina.

• **Empresa Nacional del Petroleo**—80 miles, 10¾-in., planned, Concon to Santiago, Chile.

• **Northwest Natural Gas Co.**—950 miles, 24-in., planned, Alberta fields to Vancouver, B. C., Seattle, Wash., and Portland, Ore.

Petroleos Mexicanos.—205 miles, 16-in., under way, Monterrey to Torreon, Mexico.

• **Petroleos Mexicanos.**—440 miles, 20-in., planned, Brazil to Tampico to Poza Rica, Mexico.

• **Trans-Canada Pipe Lines, Ltd. (Canadian Delhi Oil Co.)**—2,247 miles, 14 to 30-in., proposed, Alberta to Toronto to Montreal.

747 miles, 8 to 24-in., gathering system in Alberta.

• **Westcoast Transmission Co., Ltd.**—1,110 miles, 24-in., planned, Dawson Creek, B. C., through Pine Pass and Fraser River Valley to Kamloops, Princeton, and Vancouver to Portland. Ford, Bacon & Davis, engineers.

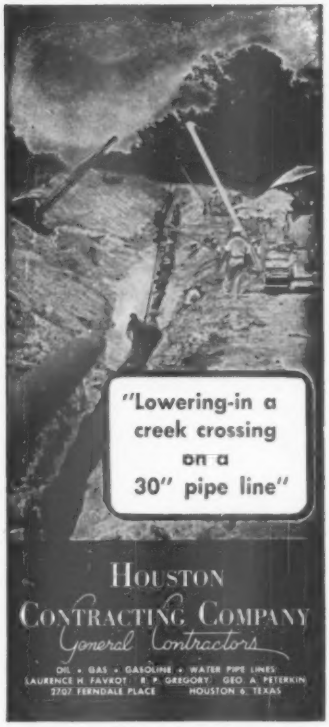
280 miles, 20-in., planned, Pincher Creek to Montana on to Spokane, Wash. Ford, Bacon & Davis, engineers.

138 miles, 20-in., planned, Sumas to Tacoma, Wash.

139 miles, 18-in., planned, Tacoma, Wash., to Portland, Ore.

• **Western Pipe Lines.**—833 miles, 24-in., proposed, from southern Alberta, eastward across the Canadian prairies, serving principal towns and cities along the route to a point near the International boundary.

"Now, tell me, stranger, if yew hit oil on my prop'ty—what'd I do with 50,000 barrels of oil?"


"Lowering-in a creek crossing on a 30" pipe line"
HOUSTON
CONTRACTING COMPANY
General Contractors
OIL • GAS • GASOLINE • WATER PIPE LINES
LAURENCE H. FAVROT R. P. GREGORY GEO. A. PETERKIN
2707 FERNDALE PLACE HOUSTON 6, TEXAS

S. E. HUEY & CO.
ENGINEERS & SURVEYORS
HENINGER BLDG.
MONROE, LA.

SURVEYING & MAPPING

PIPE LINE SURVEYS

UP-TO-DATE
PIPE LINE MAPS

Map No. 25. "Jacobson's Map Showing Crude Oil and Gasoline Pipe Lines of the United States and Canada."

SHOWS: Crude oil pipe lines in blue—gasoline pipe lines in red—key refineries with capacity barrels crude oil per day—principal cities and towns.

Size 54" x 76". Scale 1" = 40 miles.

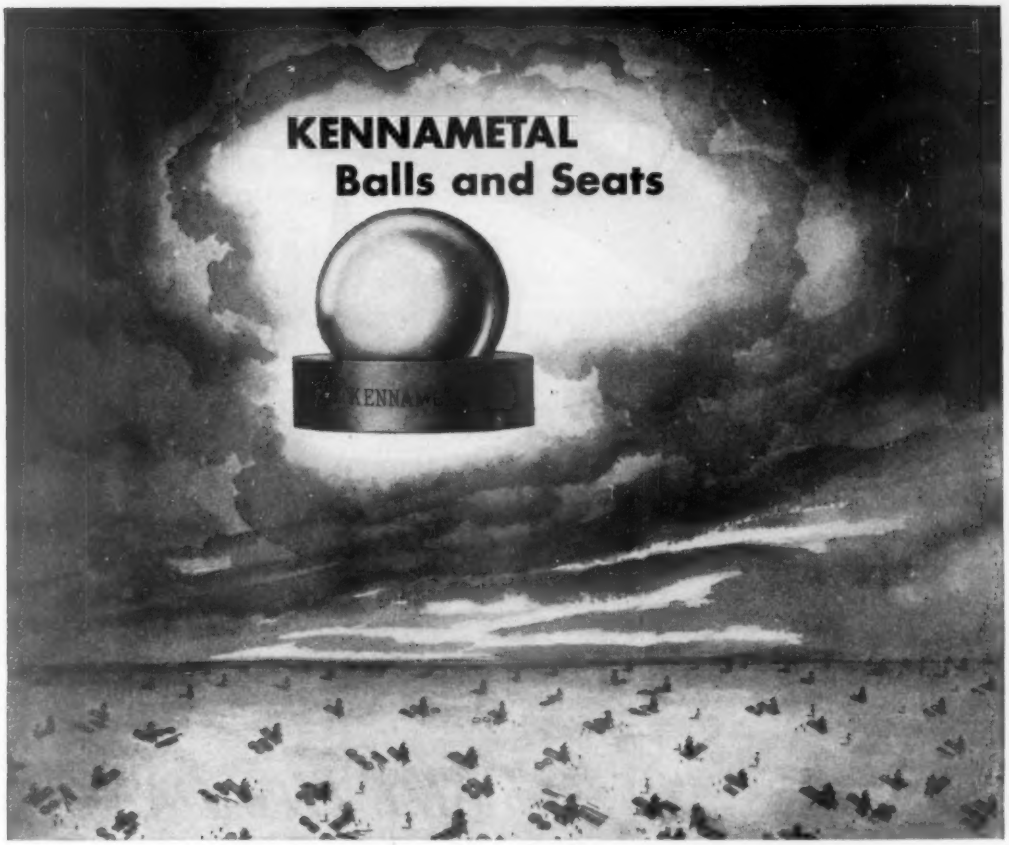
Map No. 26. "Jacobson's Map Showing Natural Gas Pipe Lines of the United States and Canada."

SHOWS: Natural gas pipe lines with pipe sizes—major gas fields in solid red—general gas areas outlined in red—cities and towns.

Size 54" x 76". Scale 1" = 40 miles.

Folder Sent on Request

E. C. JACOBSON
315 Mayo Bldg. Phone 2-1952
Tulsa (3), Oklahoma



Sky high in quality . . .

No other ball and seat gives the long valve service you'll get from Kennametal. It is the "vacuum-sintered" high quality cemented carbide made by an exclusive method which assures greater resistance to wear, greater strength and standard uniformity. It's much harder than steel, is corrosive resistant, non-magnetic, and outlasts alloy steel 20 to 1. Kennametal Balls and Seats offer maximum resistance to corrosion and pitting even under the most severe fluid pumping conditions. Because of these special qualities, you don't pull a pump because of valves when it is equipped with the Kennametal API Ball and Seat. One Texas oil producer reports, ". . . Kennametal Balls and Seats in my well had lasted 22.5 times as long as alloy steel balls—when first inspected . . . and even then showed no sign of wear." The Kennametal Ball and Seat had been in service for 448 days! The best service record of other balls and seats was only 20 days.

You will get better and longer service too—the Kennametal valve check "puts an end to down-the-hole check valve trouble," saves costly string pulls and production losses. It is precision ground and polished to stand an initial vacuum of 25 inches—5 inches above standard practice. Seats are available in both plain and rib type. Get high quality Kennametal Balls and Seats from your supply store or pump manufacturer today. Accept no substitute for *high quality* Kennametal Balls and Seats.

Kennametal

Balls and Seats

. . . put an end to down-the-hole check valve trouble

KENNAMETAL Inc., Latrobe, Pa.

Ask your supplier for Kennametal *Balls and Seats*

CRC VERTICAL SMOOTH PIPE BENDER

PROVED FAST ECONOMICAL *ON ALL SIZE PIPE LINES*

FAST— Pipe is placed in machine from either end and bent vertically. Bend easily measured with protractor; for additional bends, set measuring chain and bend to it. Bends are accurate to within ¼ degree. Machine can be moved quickly along line.

ECONOMICAL— Inexperienced operators can quickly learn operation of simple controls; low maintenance because of rugged construction; dependable and adequate power. Minimum of right-of-way required . . . 20-25 feet for both bender and tractor handling pipe; mounted on 18" Athey tracks. Powered by U-6 International Engine. Can be transported on standard truck float.

FINDINGS OF TESTING LABORATORY ON PIPE BENT WITH THIS MACHINE AVAILABLE.

CRC **CRUTCHER • ROLFS • CUMMINGS, INC.**
Pipe Line Equipment and Supplies
HOUSTON, TEXAS TULSA, OKLAHOMA

PIPE LINES

Bids Consolidated

Four plans grouped into New England gas hearings

WASHINGTON. — Four additional applications have been consolidated by the Federal Power Commission with the proceedings now in progress here involving competitive proposals for natural-gas service in New England.

The additional applications include:

1. A joint request by Tennessee Gas Transmission Co., Houston, and Niagara Gas Transmission, Ltd., Toronto, Ont., Canada, for authority to export gas to Canada.

2. A request by Tennessee for a recommendation for a presidential permit covering facilities at the U. S.-Canadian border to export the gas.

3. An application by Tennessee for an FPC certificate for pipe-line facilities in the United States to enable it to transport the additional gas for export.

4. A proposal by Tennessee to increase deliveries of natural gas to its subsidiary, Northeastern Gas Transmission Co., Springfield, Mass.

Still in progress . . . Hearings on these four applications will begin following completion of all cross-examination in the New England gas hearings, which have been in progress since November 25 and are still under way. These hearings involve applications by Northeastern, Algonquin Gas Transmission Co., Texas Eastern Transmission Corp., which would supply gas to Algonquin, and several New England gas-distributing firms. All applications are before FPC for a determination of whether any should be authorized to serve certain New England markets previously granted to Algonquin.

The proposals by Tennessee-Niagara to export gas were previously postponed pending the filing by the companies of certain data requested by the commission.

Chairman concurs . . . Thomas C. Buchanan, FPC chairman, concurred in the action consolidating Tennessee's application to increase deliveries to Northeastern, but said he could not see the relevancy of consolidating the Canadian export application with the New England proceeding, "except as a time-consuming proposition which none of us believes to be desirable."

Buchanan said that the areas to be served are foreign in all ways to each other, and added that "I cannot understand how Niagara could possibly become an 'aggrieved party' in the New England proceeding."

He added that since Tennessee Gas Transmission "is the key to both the Niagara and Northeastern applications," it is to be presumed that both applications will be controlled "within the realm of management without resort to asserting possible rights before a regulatory authority or in the courts.

"The common object of all natural-gas companies," he concluded, "is to sell all of the gas they can market."

West Texas Gulf's Line Receives, Moves First Oil

HOUSTON.—Oil has started flowing through West Texas Gulf Pipe Line Co.'s new 466-mile 20-26-in. crude-oil line from Colorado City in West Texas, to Sour Lake, Tex.

The first oil was received last week at the Colorado City pumping plant from Permian basin gathering lines, and started on its way to the Gulf Coast and the Mid-Valley area.

Lakehead to Build Line in Wisconsin and Michigan

Lakehead Pipe Line Co., Inc., will construct the extension of the Interprovincial pipe-line system from Superior, Wis., to the international border in the middle of the St. Clair River, according to T. S. Johnston, president of Lakehead and Interprovincial Pipe Line Co. Interprovincial will complete the project from that point into Sarnia, Ont. Bechtel Corp. and Canadian Bechtel, Ltd., will be managers of the project.

The undertaking has been proposed as a 635-mile, 30-in. crude-oil line. From Superior, Wis., it would extend eastward via points in the vicinity of Marquette and Munising on the upper peninsular of Michigan. It would cross to lower Michigan at the Mackinaw Straits. The terminal at Saria, Ont., is on the St. Clair River which runs along the boundary between Michigan and Ontario.

Permian Basin Pipeline and Northern Natural Amend Bid

WASHINGTON. — Permian Basin Pipeline Co. of Chicago, and Northern

Let our horizontal Boring Equipment come to *your* rescue

We specialize in removing excess circumferencial weld material inside Pipe Lines so that a "go devil" under air pressure can be used to clear out surplus oil.

Other services include:
DESCALING WATER MAINS, GAS MAINS, BITUMEN LINES, COOLING CIRCUITS AND SLURRY LINES. BITUMEN LINING WATER MAINS. TREATMENT OF DISTILLED WATER TO MAKE IT POTABLE. CLEANING OF STEAM PLANT AND AUXILIARY SERVICES.

At your Service In Any Part of the World

General Descaling CO. LTD.

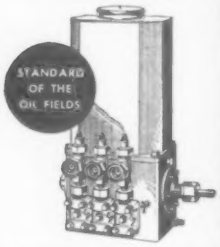
289 HANOVER ST., SHEFFIELD, ENGLAND

Power Plants Speed Construction
USE POWER TOOLS—FLOOD LIGHTS
WINPOWER PORTABLE ELECTRIC PLANTS provide a dependable, low cost power source . . . speed up work performance by operating time and labor saving power tools.
WINPOWER NITE-HAWK units give power plus flexible floodlights. Every contractor should use these high efficiency, quality built plants.
WRITE FOR LITERATURE AND PRICES
WINPOWER MFG. CO.
NEWTON, IOWA
TEL. 236
500 to 12,000 watts A.C. or D.C.

McCORD

FOR SLUSH PUMPS AND DRILLING ENGINES

TYPE "SP" Mechanical Lubricators



Built to take it—to stand up under the extreme conditions of oil field service on slush pumps and drilling engines. You can depend on McCord "SP" lubricators to deliver oil in measured quantities without interruption regardless of temperatures. Removable pump units, large clear blinker sight feeds. All moving parts enclosed. Specify McCord "SP".

McCORD CORPORATION
DETROIT 11, MICHIGAN

SAFETY-RELIEF VALVES and PRESSURE GAUGES by Lonergan

NOTED FOR
Modern Design
Accurate Construction

For years Lonergan Valves and Gauges have been widely used for oil field, refinery and pipe line service. Their dependable performance is well established. See your nearby Lonergan dealer for further information or write us for our Gauge or Valve Catalog.

J. E. LONERGAN CO.
• SINCE 1872 •
2ND and RACE STREETS
PHILA. 6, PA.
There's a Lonergan Distributor in your area.

Natural Gas Co., of Omaha, have submitted to the Federal Power Commission revised plans in connection with their proposals for Permian to build a pipe-line system in Texas and New Mexico for moving 300,000,000 cu. ft. of gas daily, and for Northern to increase its system capacity for receipt of this same amount of gas.

The amended applications reduce the amount of construction and the cost of both projects, but provide for delivery of the same volumes of gas as originally proposed.

Under the new proposal, Permian will deliver the entire volumes of gas to El Paso Natural Gas Co. at an interconnection in Yoakum County, Texas, and El Paso will then deliver the same quantities of gas back to Permian at a point in Moore County, Texas. Permian will deliver this gas to Northern at Dumas, Tex.

Permian's project as originally proposed included about 384 miles of pipe line and 74,360 hp. in compressor stations at a cost of $58,180,000. Northern's amended application includes the proposed construction of 425 miles of main lines, 62,400 hp. in compressor capacity, and numerous branch lines and additions. Estimated cost is $66,248,000. The firm originally proposed to build 440 miles of main line, 73,600 hp. in compressor capacity, and spend about $69,826,000 for these facilities.

General Petroleum Looping Crude Line From San Ardo

LOS ANGELES.—General Petroleum Corp. has begun construction of three more 10-in. loops which will provide 5,000 bbl. daily more capacity for its 40-mile crude line connecting San Ardo oil field with a marine loading station at Estero Bay, Calif.

George Supple, vice president and director of pipe lines, said that the total length of the loops would be about 13 miles. Capacity, he said, will be raised from 25,000 bbl. per day to 30,000 bbl. per day with the installation of new heaters at each of the line's three pumping stations along with the three loops. The project, Supple said, will be finished this spring at a cost of $500,000.

Limited capacity of the present line forced a temporary halt in drilling at San Ardo. General Petroleum Corp. and The Texas Co. have 195 and 190 producing wells, respectively. Superior Oil Co. has nine wells in this field. They all use the pipe line.

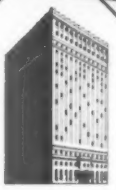
The contract for laying the three loops was awarded to J. C. Lackey, Taft, Calif.

See Composite and Refinery Catalogs, or Write for Folder On

FLEET-LINE
PIPE SADDLES AND REDUCERS

Immediate Delivery
STEEL FORGINGS, Inc.
P. O. Box 2768 • Shreveport, La.
Foot of Fannin Street

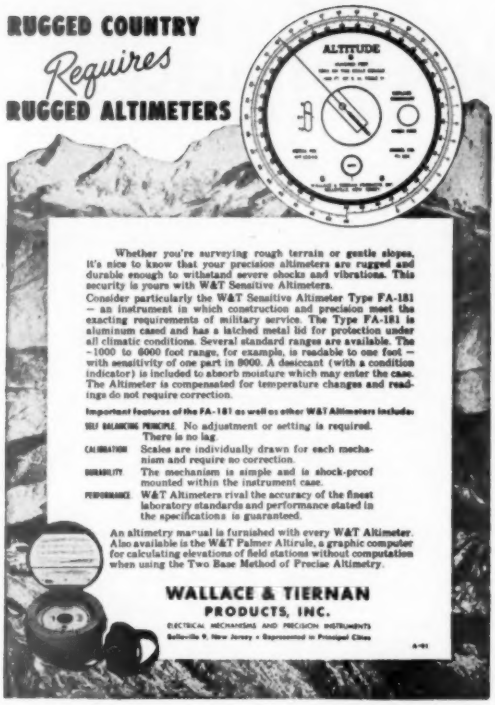
BUSINESS and Pleasure in TULSA means-



➤ AIR-CONDITIONED COMFORT
➤ CENTRAL LOCATION
➤ CONVENIENT COFFEE SHOP
➤ NEW MODERN ADJOINING GARAGE

THE MAYO
TULSA'S FINEST HOTEL
Home of the Popular Terrace Room

RUGGED COUNTRY *Requires* RUGGED ALTIMETERS



Whether you're surveying rough terrain or gentle slopes, it's nice to know that your precision altimeters are rugged and durable enough to withstand severe shocks and vibrations. This security is yours with W&T Sensitive Altimeters.

Consider particularly the W&T Sensitive Altimeter Type FA-181 — an instrument in which construction and precision meet the exacting requirements of military service. The Type FA-181 is aluminum cased and has a latched metal lid for protection under all climatic conditions. Several standard ranges are available. The −1000 to 6000 foot range, for example, is readable to one foot — with sensitivity of one part in 8000. A desiccant (with a condition indicator) is included to absorb moisture which may enter the case. The Altimeter is compensated for temperature changes and readings do not require correction.

Important features of the FA-181 as well as other W&T Altimeters include:

SELF BALANCING PRINCIPLE. No adjustment or setting is required. There is no lag.

CALIBRATION. Scales are individually drawn for each mechanism and require no correction.

DURABILITY. The mechanism is simple and is shock-proof mounted within the instrument case.

PERFORMANCE. W&T Altimeters rival the accuracy of the finest laboratory standards and performance stated in the specifications is guaranteed.

An altimetry manual is furnished with every W&T Altimeter. Also available is the W&T Palmer Altirule, a graphic computer for calculating elevations of field stations without computation when using the Two Base Method of Precise Altimetry.

WALLACE & TIERNAN PRODUCTS, INC.

ELECTRICAL MECHANISMS AND PRECISION INSTRUMENTS

Belleville 9, New Jersey • Represented in Principal Cities

A-181

DITCHIN' For A 30 INCHER

It's an **OK** *Job . . . If it's done by . . .*

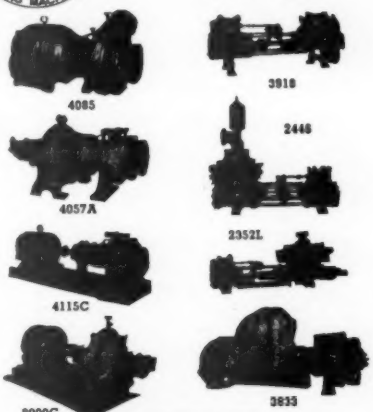
OKLAHOMA PIPE LINE CONSTRUCTORS

6612 HARRY HINES DALLAS, TEXAS

PUMPS

CENTRIFUGAL
RECIPROCATING

BUILDERS OF OUTSTANDING PUMPS
Since 1869



ESTABLISHED 1869

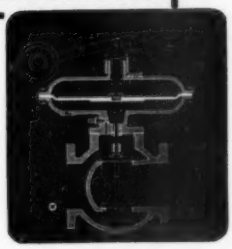
DEAN BROTHERS PUMPS INC.

INDIANAPOLIS IND.

323 W. TENTH ST.

SUPERSENSITIVE!

The DAVIS No. 335W Gas Relief Valve



QUICK FACTS:

1. SIMPLE, DEPENDABLE. Widely used for relief service in vapor recovery systems for refineries, natural gasoline and chemical plants.
2. HIGH SENSITIVITY. Oversize diaphragm assures dependable operation on pressure changes equivalent to a fraction of an inch of water.
3. STEADY, NO PULSATION. By-pass steadies valve action and prevents vibration under most severe operating conditions.
4. WEATHERPROOF. Rugged; suitable for indoor or outdoor use. No packing to maintain. Exclusive rain cap protects diaphragm. Ask for Bulletin G-1.

DAVIS REGULATOR COMPANY

2543 South Washtenaw Ave., Chicago 8, Ill.

Distributor: Westcott & Greis, Inc., Tulsa and Houston

INFERNO Oil Burners

Secure

More

HORSEPOWER

The INFERNO OIL Burner is really a boiler fuel carburetor, mixing air directly with the fuel and steam, which results in less steam being used to atomize a given amount of oil and a hotter fire. By maintaining this hotter fire it is possible to secure 10% to 20% more horsepower from the same boiler. For more information write for Bulletin 24.

THE INFERNO CO.

Box 1138A
115 RICOU St.
SHREVEPORT, LA.

MOVE Rigs and set 'em up FASTER with SIMPLEX SCREW JACKS

Many drillers are saving time by permanently attaching Simplex Screw Jacks to the underside of their rig floor. When the rig is to be moved, turnbuckle bracing is unfastened and jack is swung up, out of way. At new location, jack is swung down, turnbuckles attached and jack is ready to level rig. Jack can't get lost, is always available for use.

There's a complete line of Simplex jacks—screw, lever, hydraulic—for all oil field uses.

SEND FOR FREE CATALOG

Simplex
LEVER • SCREW • HYDRAULIC
Jacks

TEMPLETON, KENLY & CO.

1034 S. CENTRAL AVE., CHICAGO 44, ILL.

Among the Drilling Contractors

McCabe Joins Rupe in Contracting Business

Henry F. McCabe, formerly supervisor of field sales for Sivalls Tanks, Inc., Odessa, Tex., has become associated with Charles Rupe as co-owner of Charles Rupe Drilling Co., Coleman, Tex. He will make his headquarters at Abilene, Tex. The company operates three rotary rigs in West Texas.

Rupe, co-owner, has been in the rotary drilling business for 35 years, the last 15 years as an independent contractor. McCabe has been active in West Texas oil-field equipment circles for many years. Prior to his connection with Sivalls Tanks, Inc., he was associated with Fred Turner, Jr., Midland, and previously to that with Black, Sivalls & Bryson, Inc., also at Midland.

Simpkins Opens Office

Joe Simpkins, drilling contractor, with main offices at St. Louis, has opened a field office at Fairfield, Ill., Dewey Schick is tool pusher with headquarters at Mount Vernon, Ill.

Marsh & Pursell will drill for M.K.M. Oil Co. at 1 Buttram-Government, a wildcat located in the Bothwell Draw area, a mile west of Salt Creek, in Natrona County, Wyoming. Spot is in the NE NW NW 32-40n-79w.

Halko Drilling Co., Shawnee, Okla., has a new operation under way in the recently revived area east of the Maud field, Pottawatomie County, Oklahoma. L. S. Youngblood and John Halko, owner of the drilling company, are joint operators in the venture. Location is for 1 Wallace, in the NE NE NE 17-8n-5e, offset to the Simpson dolomite producer which revived the area.

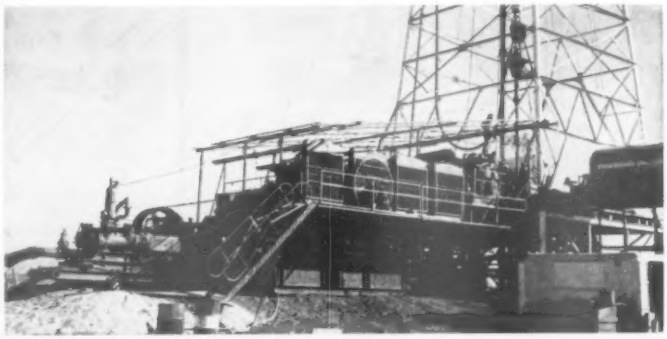
Longhorn Uses New Rig On Southern Texas Job

Longhorn Drilling Corp., San Antonio and Three Rivers, Tex., has acquired a new heavy-duty rotary rig, an Oilwell 76 assembly, powered by three LRO Waukesha engines and provided with a new 133-ft., 700,000-lb. capacity, special-duty Lee C. Moore drilling mast. The rig is being set up for its first well, a contract job for Leland Fikes and H. S. Cole, Jr., in Goliad County, South Texas. The well, 1 Wheelock, will be a Wilcox sand test, projected to 8,700 ft.

This contractor also reports having the contract for an 8,000-ft. wildcat test to be drilled for James R. Buck of Houston at 1 Greene & Korth, in DeWitt County, also in South Texas.

Kemp Drilling Co., Shreveport, has another new operation under way for Magnolia Petroleum Co. in the Kingston field, Adams County, Mississippi. It is 2 Benoist-Swayze unit, in 11-5n-2w, projected to 6,700 ft.

Cummings Drilling Co., Mission, Tex., is under contract with Kirby Petroleum Co. for a 6,000-ft. wildcat test



Deep-drilling rotary rig being operated by Brinkerhoff Drilling Co., Dallas, and Casper, Wyo., in Yoakum County, West Texas. It has a National 125 draw works and is powered with four LRO engines. Two mud pumps, one a C-350 and the other a C-250, are provided. It uses a 136-ft. derrick with 30-ft. base, with a 14-ft. substructure. On location is 14,500 ft. of 4½-in. drill pipe.

Why Shaffer is headquarters

for pressure control equipment!

No matter what your requirement in pressure control equipment—Cellar Control Gates, Blowout Preventers, Casing and Tubing Heads, Flow Beans, or other equipment for controlling pressures in modern drilling and production operations—nowhere else will you find as complete a selection of such equipment as at Shaffer.

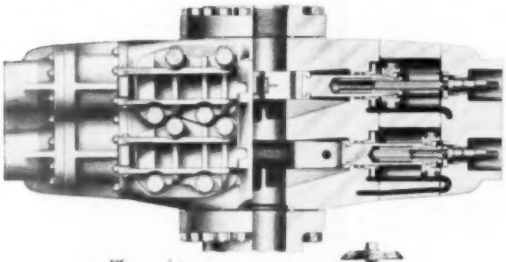
For example, in Cellar Control Gates alone, Shaffer provides a choice of *Hydraulic* or *Mechanical* types—and in each type a choice of *Double* or *Single* design. Also, you get a choice of *two* different types of Blowout Preventers . . . of *many* different types of Landing, Casing and Tubing Heads . . .and even Shaffer Flow Beans are available with *three* different types of tips to meet your *particular* needs. Best of all, every Shaffer product is backed by over a quarter-century of pressure control dependability and experience!

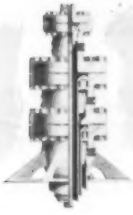
Only Shaffer provides such pressure control advancements as outlined below . . .

Shaffer Hydraulic Cellar Control Gates

- Available in both *Double* (illustrated) and *Single* types.
- Both types are amazingly compact . . . Double (with *two* ram compartments unitized into *one* body) is only 30" high in sizes as large as 13⅝" (12" Series 900) . . . Single is only 18½" high in same size. Smaller sizes even less!
- Unmatched simplicity in changing rams—simply unbolt two doors, change rams, close and bolt the doors. Rams are automatically aligned as doors are bolted shut!
- Completely Enclosed Design . . . Quick-Draining Compartment Bottoms . . . Direct Hydraulic Drive . . . these and other exclusive features make Shaffer Hydraulic Cellar Control Gates the outstanding choice for all types of drilling conditions.

Be sure to get the complete story on this Shaffer product before you buy *any* cellar control gates. Available in a full range of sizes and pressure ratings!





SHAFFER LANDING, CASING AND TUBING HEADS

—meet every requirement for modern compact casing and tubing suspensions.

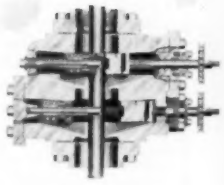
- Available in various types and packing arrangements. Base Heads and Combination Base, Casing and Tubing Heads are available for combining several units into one where space is at a premium.

Shaffer provides a full line of modern Tubing Heads, Multiple Zone Hook-Ups and other equipment to complete your pressure control installations.

SHAFFER ADJUSTABLE FLOW BEANS

—the *pioneer* adjustable flow bean, still unequalled in operating features.

- Available with Conical, Micro and electrically-heated Thermo Tips in both regular and hard metal designs to meet various drilling, production and refinery applications. All popular sizes—in both flanged or screwed connections.



SHAFFER MECHANICAL CELLAR CONTROL GATES

- Available in both **Double** (illustrated) and **Single** types for effective operation by an air motor drive utilizing the air supply available at most rigs—**plus manual stand-by protection!**
- Even in sizes as large as 13⅝" (12" Series 900) the Double type requires less than 29" cellar height, the Single less than 17½"!
- Rams are changed by simply removing **one** end cover . . . Quick-Draining Ram Compartments provide no place for detrimental mud accumulations . . . many other unique features make these gates outstanding in their field.

Wherever your operations call for mechanically-operated cellar control gates, Shaffer has the most advanced design available!

SHAFFER COMBINATION ROTATING BLOWOUT PREVENTERS AND STRIPPERS

—combine in one unit every necessary feature for complete pressure control while drilling.

- Maintains continuous seal around any element in the drill string—pipe, couplings, kelly, drill collar, etc.—**automatically**, whether string is rotating, being raised or lowered, or is stationary.
- Can be used with **any** standard kelly (square, hexagonal or octagonal)—and any type of drill pipe (coupled, upset or flush). No special drill string equipment is needed!
- Quick-Releasing Bonnet permits passing bits, reamers, other large-diameter tools through the unit quickly and easily.

Available in two types and in a complete range of sizes, nothing else equals a Shaffer Preventer for complete pressure control while the drill string is in the well!

Do You Have Complete Details on SHAFFER FISHING TOOLS?

Besides leadership in pressure control equipment, Shaffer also provides similar unique advantages in fishing tool equipment—*advanced* tools that combine several tools into one, tools that feature field-proven operating safety found nowhere else. Write for descriptive literature!

Write for your free copy of the new Shaffer Catalog.

SHAFFER

HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT • FISHING TOOLS THAT EXCEL

SHAFFER TOOL WORKS, Brea, California • California Service Shops: Santa Fe Springs and Taft
HOUSTON, TEXAS, 6006 Navigation Blvd. • ODESSA, TEXAS, 1925 West Second Street
OKLAHOMA CITY, OKLAHOMA, Acme Oil Tool Company, 1001 S. E. 29th Street
CASPER, WYOMING, Shaffer Tool Works, Post Office Box 1788
EXPORT SALES OFFICE: Shaffer Tool Works, 500 Fifth Avenue, New York, N. Y., U.S.A.

30 years

For L-O-N-G-E-R THREAD LIFE

Use these famous Jimmie Gray Tool Joint and Drill Collar Compounds

You'll like this new Jimmie Gray Dope Brush, too!

YES SIR—sold through your favorite supply store

PETROLEUM DISTRIBUTING COMPANY

BOX 203 - HOUSTON, TEXAS - CHarter 5648

Quality Oil Field Lubricating Oils and Greases

to be drilled 14 miles northwest of Mission, Hidalgo County, in the lower Gulf Coast of Texas. Location is in the G. O. Newman subdivision, Hidalgo County School Land Survey.

Viersen & Cochran, Inc., Okmulgee, Okla., will drill a geological wildcat test for Oklahoma Natural Gas Co. in the West Lovell area, 3½ miles south of the town of Lovell, in Logan County. The new operation, 1 Rigdon unit, located in the NW SW NW 28-18n-4w, is projected to the Wilcox, expected around 6,250 ft.

Butler-Johnson Service Corp., Shreveport, has the contract for a proposed 10,000-ft. Wilcox wildcat test to be drilled for J. R. Butler 1½ miles west of Lecompte, in Rapides Parish, central Louisiana. Location is for 1 C. O. Freeman and others, in 1-1n-1w.

Creighton Drilling Co., Tulsa, is drilling for Mid-Continent Petroleum Corp. at a wildcat location, 1 Turek, 6 miles north of Medford, in the NW NW SW 32-28n-4w, Grant County, northern Oklahoma. Hole is projected to 5,300 ft. for a test of the Wilcox.

Crescent Drilling Co., Monroe, La., is starting a new Davis sand test, projected depth 9,700 ft., on the west flank of the Choudrant field, Lincoln Parish, Louisiana. The test, in 9-18n-2w, ¾ mile from nearest production, is for Crescent Production Co., an affiliated company, and C. N. Valerius and associates.

Warren-Bradshaw Exploration Co., Tulsa, has contracted with The Texas Co. for an Oil Creek sand test to be drilled at a wildcat location 3 miles southeast of the East Oconee field, in the south-central part of Coal County, southeastern Oklahoma. The test will be carried as 1 Hodges, and is spotted in the NE NE SE 6-1s-10e.

ACTIVE ROTARY RIGS*

(United States and Western Canada)

	Week ended	Change week ended	
Area—	2-16-53	2-9-53	2-18-52
Gulf Coast	594	—20	+ 15
N. & W. Tex.-N. M.	792	—25	—243
Ark.-N. La.-E. Tex.	123	— 2	— 37
Oklahoma	309	—11	— 42
Kansas-S. Nebraska	166	—17	— 5
Illinois-Eastern	98	—11	+ 19
Rocky Mountains	195	— 8	+ 40
Pacific Coast	169	+ 4	— 4
Total U. S.	2,446	—90	—257
Western Canada	162	+19	— 17
Total	2,608	—71	—274

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the Rocky Mountains, and Western Canada areas are shown on pages 252 and 253.

GREAT BEND FISHING TOOL CO.

GREAT BEND, KANSAS

affiliated with

ACME OIL TOOL COMPANY

- COMPETENT OPERATORS
- ROTARY FISHING TOOL SERVICE
- SPANG CABLE TOOLS • DRILL PIPE
- BLOW OUT PREVENTERS • RENTALS
- COMPLETE OIL FIELD MACHINE SHOP

the bowl on . . .

ACME'S 'BAT' ROTARY RELEASING OVERSHOT

will not back off with left hand torque and STRING SHOT OPERATIONS

MFG · RENTALS · ENG · ACME · REPAIRS

CALL:

OKLAHOMA CITY MElrose 8-1556

GREAT BEND 7810-7819

Standco NO-SMOKE

STANDCO BRAKE LINING

For the easiest brake known. It feeds off evenly. Standco never scores brake rims. See pages 4811-4830, Composite Catalog.

Standco Brake Lining Co.

HOUSTON

Engineered "Wool"

...to keep a baby warm!

Lucky baby!

You'll be snug and comfortable under your soft Dynel blanket. For it's as warm as wool, yet it has properties a sheep never dreamed of . . . and they were all engineered into it by modern chemical science. Dynel is strong, flame-proof, mildew and moth proof. It's light, and comes from the wash as fluffy as a kitten.

Dynel, Orlon, Dacron, Acrilan, Vicara and other man-made "wonder" fibers are spun from chemical solutions which must be kept absolutely pure throughout their many processing operations. To guard against contamination or discoloration resulting from valve corrosion, the makers of Dynel and other new fibers use ALOYCO Stainless Steel Valves.

Like the manufacturers of synthetic fibers, other leading chemical firms handling everything from blood plasma to oil refinery sludge have brought their corrosion problems to the *Aloyco Corrosion Engineering Service*. There, in the laboratories of the world's largest specialist in corrosion-resistant valves, the right alloy and the right type of valve have been found for every specific corrosive problem. In fact, the use of ALOYCO valves goes hand-in-hand with progress in the chemical industries.

So if corrosives play a part in your business, write to ALOYCO about your own valve needs.

ALLOY STEEL PRODUCTS CO., INC.
1314 West Elizabeth Avenue, Linden, N. J.

3.2

HENRY H. PARIS DISTRIBUTOR Inc.
Manufacturer's Agent - Oil Well and Refinery Supplies
P. O. BOX 932 1125 ROTHWELL ST.
HOUSTON, TEXAS

Agent and Distributor for the following Nationally Known Manufacturers:

ALTEN FOUNDRY & MACHINE WORKS
Lancaster, Ohio
Pumping Units, Jacks & Surface Equipment.

DRESSER MANUFACTURING DIV.
Bradford, Pa.
Seamless Welding Fittings

GLOBE MACHINE & NIPPLE CO.
Houston, Texas
Arrow Brand Pipe Nipples—All Kinds.

THE GORMAN-RUPP COMPANY
Mansfield, Ohio
Centrifugal Pumps.

HARRISBURG STEEL CORPORATION
Harrisburg, Pennsylvania
Forged Steel Flanges and Seamless Casing Couplings

LOS ANGELES BOILER WORKS
Los Angeles, California
Welding Caps—Dished & Flanged Heads.

MILLS IRON WORKS, INC.
Los Angeles, California
Seamless Swage Nipples, Bull Plugs & Welding Reducers.

MUD PRODUCTS, INC.
Tulsa, Oklahoma
Mud "O" Ring Butterfly Valves.

THE OHIO INJECTOR COMPANY
Wadsworth, Ohio
OIC VALVES, Bronze, Iron, Cast and Forged Steel for all purposes.

OIL STATES EQUIPMENT COMPANY
Houston, Texas
OESCO Silvertop Fusible Plugs with renewable inserts for all types OIL COUNTRY BOILERS.

STEEL FORGINGS, Inc.
Shreveport, La.
Weld Saddles.

VOLCANO BURNER COMPANY
Houston, Texas
Volcano Superior and Gulf States All Steel Gas Burners for OIL COUNTRY BOILERS.

WESTERN SAFETY BARREL STAND
Houston, Texas
Stand lifts, holds, tilts 55 gal. barrels. Prevents spillage—easily loaded.

WHEELING MACHINE PRODUCTS CO.
Wheeling, West Virginia
XL Steel Pipe Couplings for OIL COUNTRY TUBULAR PRODUCTS.

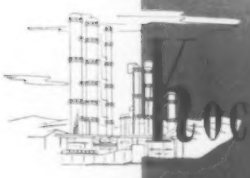
KOCH

has a world of experience

in ENGINEERING and CONSTRUCTING REFINERIES

From West Texas to India, and from Canada to South Africa, Koch has earned a reputation for engineering and constructing refineries. Koch combines top-flight engineering talent with practical refinery experience to provide the most flexible unit for a minimum investment.

You have a standing invitation to "call on Koch" to discuss your next refinery project.



KOCH ENGINEERING COMPANY, INC.

DESIGNERS • MANUFACTURERS • BUILDERS
221 WEST DOUGLAS • WICHITA 2, KANSAS

BRITISH ASSOCIATES • MESSRS. A. F. CRAIG & CO., LTD., PAISLEY, SCOTLAND

REFINING

Modernization of Co-Op's Cushing Plant Advances

CUSHING, Okla.—Modernization of the Midland Co-Operative wholesale refinery here is running ahead of schedule. When the job is finished the refinery will have a new U.O.P. fluid catalytic cracking unit.

Present facilities have a capacity of 4,200 bbl. of crude daily. This will be boosted to 10,500 bbl. daily when the modernization program is completed.

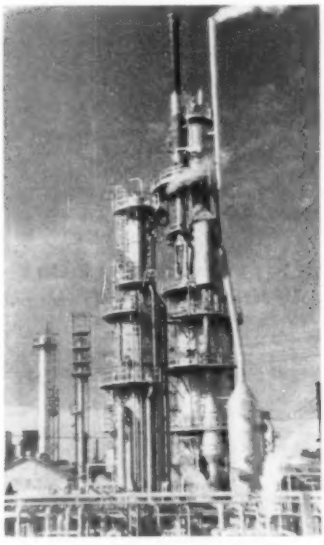
Work on the $3,500,000 expansion program is scheduled for completion by July 1. The ceramic cooling tower now being installed will be the seventh, and largest in the industry.

"Electronic Brain" Used For Refinery Control?

A further step toward automatic operation of oil refineries is visualized by Remington Rand, Inc., through future use of its new "ERA 1103" general-purpose electronic digital-computing system. The new ultra-high-speed unit, developed originally for the Government, will be available for delivery next year.

According to the manufacturer, the device can make automatic processing possible in refineries and chemical plants. It will receive data through "sensing" devices on process conditions. These data would be processed in the computer in accordance with instructions previously fed in, governing such variables as pressure, temperature, flow rate, and residence time.

By completely controlling such unit conditions, the "brain" could so regulate operations to maintain optimum refinery output it is claimed. Further, if desired, the computer can receive data based on the analysis of the crude oil or other charge stock to a unit, and in turn can regulate the unit's operation to achieve the highest dollar realization in products, its manufacturers conclude.



New Cat Cracker

Above is the new catalytic cracking unit at Anderson-Prichard Oil Corp.'s Arkansas City, Kans., refinery. The refinery was acquired by Apco last December through purchase of the controlling stock in Kanotex Refining Co. at Arkansas City.

Jefferson Chemical Co. is Making Nonyl Phenol

Jefferson Chemical Co., Inc., has started operation of a new general-purpose chemical-process unit at the Port Neches, Tex., petrochemical plant. The unit's initial production is nonyl phenol, in commercial quantities.

This intermediate is used in the manufacture of nonionic surface-active agents, rubber chemicals, and lubricating oil additives and as a starting material in the preparation of certain resins and plasticizers.

Minor field design changes in the new unit will permit the production of other related chemicals, as market conditions justify.

Continental Buys Bryton's Trainer, Pa., Facilities

PONCA CITY, Okla.—The plant and manufacturing facilities of Bryton Chemical Co. at Trainer, Pa., about 20 miles southwest of Philadelphia, has been purchased by Continental Oil Co. here.

Bryton was one of the first producers of synthetic oil-soluble sulfonates for use in industry, and its products are used in lubricating-oil additives, dry-cleaning detergents, and textile, cutting, and leather-finishing oils.

E. W. Carlson, Robert L. Anderson, and Vernon F. Beyer, founders, will continue under Continental's ownership

LUBRICATE PLUG VALVES 10 to 15 times FASTER

One Company saved over $10,000.00 in one year!

Reduces plug valve maintenance costs ⅓.

Using the low-cost DELTA-DESCO SYSTEM one operator can lubricate 10 to 15 valves in the time usually required to lubricate one with the conventional jack screw. Think of the man-hours saved.

DELTA-DESCO Plug Valve Lubrication SYSTEM Includes DELTA Adapter Fittings, High Pressure Gun, DESCO Specialized Lubricants, and Engineering Service. Write for facts and figures.

ANOTHER VALVE SAVER —

DELTA AUTOMATIC Plug Valve LUBRICATOR

A simple device, lubricates valve each time it is opened and closed. Ideal for loading platform, manifold, LPG and other frequently used valves. Ask for catalog.

The Only Complete Plug Valve Lubrication Company

DELTA ENGINEERING SALES CO.

806 Louisiana Ave. • Phone 5-2416

SHREVEPORT, LOUISIANA, U.S.A.

Sales Offices In All Principal Cities

"SERV-RITE"

Insulated Thermocouple Wire Extension Lead Wire

FOR

PLATINUM COUPLES
CHROMEL ALUMEL
IRON CONSTANTAN
COPPER CONSTANTAN
IRON CUPRONEL

No matter what your wire or insulation requirements may be, you can depend on Gordon "Serv-Rite" insulated wire for pyrometers—recognized as a standard of highest quality for nearly half a century. All "Serv-Rite" wire is now manufactured in the new, completely modern Gordon plant, employing up-to-date equipment and machinery, supervised and operated by skilled technicians—your guarantee of continued precision quality. In addition to maintaining large stocks of all common types of wire, Gordon will manufacture special insulation, in long or short runs, to suit your individual needs and meet your most rigid specifications.

All Types of Insulation

Felted Asbestos
Asbestos Braid
Weatherproof Braid
Glass Braid
Polyvinyl Plastic
Nylon Braid
Stainless Steel Armored Braid
Silicone Treated
Cotton Braid
Lead Jacket

The home of "SERV-RITE"

Full Particulars on Request

GORDON SERVICE

CLAUD S. GORDON CO.

Manufacturers & Distributors

Thermocouple Supplies • Industrial Furnaces & Ovens
Pyrometers & Controls • Metallurgical Testing Machines

Dept. 29 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 29 • 2035 Hamilton Ave., Cleveland 14, Ohio

to manage the plant and sell products under the Bryton name.

Purchase of these facilities, according to Harold G. Osborn, vice president of manufacturing for Conoco, marks a further step in the expansion of Continental's activities in the petrochemical field. "It provides us with a new line of chemical products and will enable us better to service industry's greatly increased demand for synthetic oil-soluble sulfonates," he said.

Conoco operates a sulfonation plant in Chicago, and is now completing an expansion program at its Baltimore plant.

$8,000,000 Addition to Deer Park Plant Completed

HOUSTON. — Completion of an $8,000,000 addition to its chemical plant located at Deer Park, Tex., has been announced by Rohm & Haas Co.

The new facilities will produce both ethyl acrylate and methyl acrylate, intermediate chemicals used in the production of plastics, synthetic rubber, and for improving viscosity and lowering pour point of lubricating oil.

The chemicals will be produced using a process based on acetylene chemistry developed by German scientists and perfected by Rohm & Haas chemists and engineers.

Capacity of Cracker Being Increased at Ohio's Plant

ROBINSON, Ill.—Capacity of Ohio Oil Co.'s cat cracker at the refinery here is being increased by nearly 25 per cent. This increase will raise the refinery's fluid-type unit from 14,500 to 18,000 bbl. daily. A similar capacity increase is being made to the Robinson plant's cat poly unit which will be raised from 1,300 to 1,600 bbl. per day.

Currently under construction at Ohio's Robinson refinery are two new major units. The larger of these new installations is a houdriformer rated at 8,000 bbl. per day. The other is a 6,000-bbl. per day delayed coker. Both new units are scheduled for service in 1953.

Refining Briefs

Port Fuel Oil Co., Inc., is installing a 1,500-bbl. per day vacuum-distillation unit in its 6,000-bbl. per day topping plant at Brownsville, Tex.

Capacity of the Platformer recently installed at the Alma, Mich., refinery of Mid-West Refineries, Inc., is scheduled to be boosted to 2,200 bbl. per day this year. Initial capacity rating on the unit was set at 1,800 bbl. daily. In addition to increasing its Platformer capacity, Mid-West is stepping up its thermal cracking capacity from 2,400 to 3,600 bbl. per day. Crude-oil capacity of the refinery stands currently at 10,000 bbl. per day.

M. W. Kellogg Co. has been awarded contract for construction of a 60,000-bbl. per day crude-distillation unit to be built at Esso Standard Oil Co.'s Bayway refinery, Linden, N. J. The three-stage unit is similar in design to two which are now under construction by Kellogg at Esso's Baton Rouge, La., refinery.

NATIONAL AIROIL FUEL OIL - GAS BURNERS SERVING INDUSTRY FOR 41 YEARS

• Steam Atomizing Oil Burners
• Mechanical Atomizing Oil Burners
• Low Air Pressure Oil Burners
• Rotary Oil Burners
• Industrial Gas Burners
• Combination Gas and Oil Burners
• Tandem Block Combustion Units
• Fuel Oil Pump Sets
• Refractory Burner and Muffle Blocks
• Valves, Strainers, Furnace Windows

Detailed information gladly sent you upon request.

Automatic Oil Burners for Homes, Churches, Apartment Houses, Factory Buildings and Office Buildings

Established 191[illegible] Incorporated 1917

NATIONAL AIROIL BURNER COMPANY, INC.

1236 East Sedgley Ave., Philadelphia 34, Pa.
S. W. Division: 2512 So. Blvd., Houston 6, Texas

VICTOR ALLOY STUDS

Serving the Industry

Victor's long experience in meeting industry specifications for alloy fastenings is your guarantee of dependable performance from VICTOR alloy studs.

Write for the new VICTOR catalog.

VICTOR PRODUCTS CORP.

2635 W. BELMONT AVE. • CHICAGO 18, ILL.

NATURAL GAS

Gulf Interstate Hearings Scheduled for March 2

WASHINGTON.—Hearings will begin here March 2 on the application by Gulf Interstate Gas Co., Houston, which proposes to construct an 860-mile natural-gas pipe line extending from southern Louisiana to a point in northwestern Kentucky, to move gas entirely on a fee basis for United Fuel Gas Co. *(The Oil and Gas Journal, March 24, 1952, page 80).*

The proposed project would cost about $127,887,000, and would transport 375,000,000 cu. ft. of gas daily for United Fuel. The gas would be moved to United Fuel in Boyd County, Kentucky, and to Central Kentucky Natural Gas Co., an affiliate of United Fuel, in Montgomery County, Kentucky.

Gulf Interstate's project is unique in that it will be the first large line to transmit natural gas on a fee basis without ownership of gas handled. The undertaking is significant as a far-sighted effort of an established eastern gas system (United Fuel is a subsidiary of Columbia Gas System, Inc., of New York) to directly procure reserves in the Southwest for future needs.

Form 11 Amended by FPC

WASHINGTON. — The Federal Power Commission has amended its rules by revising Form No. 11, the monthly statement of operating revenue and income covering natural-gas companies, to call for additional information from the reporting firms.

The revision is to be used for monthly statements beginning as of January, and are to be filed by the last day of the month following the one covered by the statement.

The form, as revised, is designed to obtain monthly information concerning gas-operating revenues, revenue deductions, and income.

Hearing Set March 2 by FPC On Arkansas Louisiana Job

WASHINGTON.—Hearings will begin here March 2 on Arkansas Louisiana Gas Co.'s application involving construction and operation of a 7,500-hp. natural-gas compressor station in Clark County, Arkansas, and the laying of a short 12-in. lateral pipe line, at an estimated cost of $2,147,470.

The project is designed to make available substantially greater volumes of gas to existing customers in central Arkansas.

Natural-Gas Briefs

WASHINGTON.—A hearing will begin here April 23 on an application by New York State Electric & Gas Corp., Ithaca, involving construction of natural-gas pipe-line facilities in the Auburn, N. Y., area. The Federal Power Commission will hear testimony on requests that the firm not be declared a "natural gas company" under the Natural Gas Act, or to appropriate authorization to construct and operate the proposed facilities.

New York.—Natural-gas sales in December 1952 totaled 5,129,000,000 therms, an increase of 12.5 per cent over sales of 4,599,000,000 therms in December 1951, the American Gas Association reports. Sales of natural gas for the 12-month period ending December 31, 1952, totaled 48,772,000,000 therms, a rise of 9.1 per cent over 44,718,000,000 therms sold a year earlier.

WASHINGTON. — A decision by the Federal Power Commission's chief presiding examiner authorizing Iowa-Illinois Gas & Electric Co. to build 22 miles of gas pipe line and continue operation of other facilities in Iowa has become effective as the final decision and order of FPC.

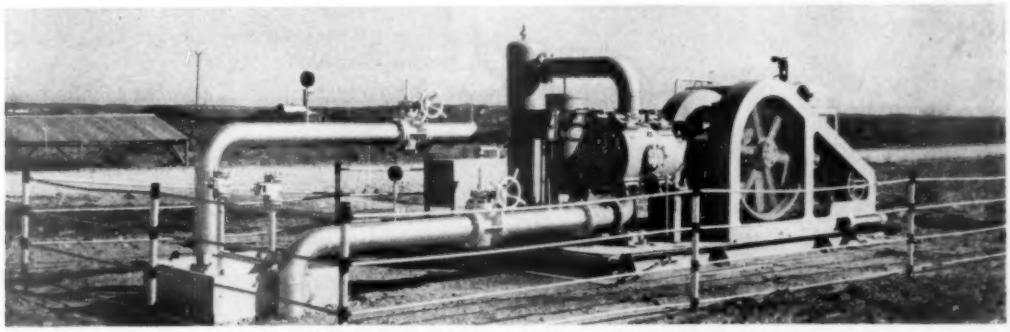
Natural Gasoline

Union Completes New Plant In Belgian Anticline Field

LOS ANGELES.—Union Oil Co. recently completed a small natural-gasoline plant in Belgian Anticline field, Kern County, to handle the company's increasing gas output in the field.

The plant is handling about 6,000 M.c.f. daily. Of the compression-absorption type, rectified heavy gasoline fractions are used for absorption oil in place of high molecular weight materials.

Development during the past 9 months in the northwest portion of the field has resulted in its gas production increasing to about 35,000 M.c.f. daily. Gas from the remaining properties, which are held by Pacific Western Oil Corp., Tide Water Associated Oil Co., The Texas Co., and Ohio Oil Co., partially will be processed in the nearby Cymric plant of Honolulu Oil Corp.



Automatic Outdoor Field Compressor

This field compressor is out in the open in Bedford field, 10 miles east of Dollarhide, in Andrews County, West Texas, and picks up wet gas from El Paso Natural Gas Co.'s Jal No. 2 plant. The compressor is an automatic Worthington 15 by 11.

Conventional or Emulsion?

With either kind of mud it pays to use

DRISCOSE*

No matter what your choice of drilling muds —conventional or emulsion—DRISCOSE can be profitably used in practically any drilling area. Saves you time, trouble and money.

In fresh water muds or lime muds, in muds contaminated with salt or calcium sulphate, desirable drilling characteristics are usually easier to get *and maintain* with additions of DRISCOSE.

And DRISCOSE has proved itself to be a good stabilizer in oil emulsion muds. Actual well histories show that DRISCOSE provides better log interpretations through higher resistivity. Stability is excellent, even at sustained high temperatures.

Regardless of the type, Driscose-base muds have good water loss control, thin filter cake and high resistance to chemical and bacterial action. All these factors represent savings in your drilling mud program.

Ask our highly trained, experienced drilling mud engineers for practical advice on your special drilling problems. Order DRISCOSE through your regular drilling mud dealer.

*DRISCOSE *is a trademark for Sodium Carboxymethylcellulose*

DRILLING SPECIALTIES COMPANY

BARTLESVILLE, OKLAHOMA

Nebraska's Salina Basin

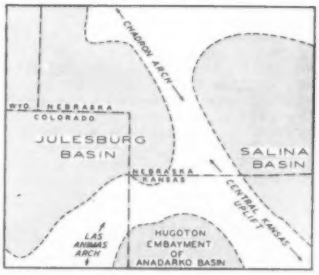
EXPLORATORY interest is again on the increase in the Nebraska portion of the Salina basin and on the Chadron arch, which limits the basin on the west.

It was nearly 3 years ago that South-Central Nebraska got its first production. A wildcat in Harlan County, just ½ mile north of the Kansas line and 6 miles north of Huffstutter, the northernmost pool on the Central Kansas uplift, was completed as a small oil producer from the Pennsylvanian-Lansing. Subsequent drilling, however, was disappointing and there have been no significant developments north of the state line to date.

Though this portion of Nebraska is still essentially productionless it is believed to offer conditions favorable for the accumulation of petroleum. Here's what the American Association of Petroleum Geologists, "Possible Future Petroleum Provinces of North America" has to say about the Salina basin: ". . . because of the complexity of the sedimentary section and the unconformable relation of the formations at the surface, exploration has been difficult. As the sedimentary section contains favorable reservoir and source beds, and major structural movements are known to have occurred in the area, probably only a successful exploration method remains to be found to prove much of the area productive."

Salina basin . . . There is no significant production of either oil or gas in the Salina basin of Nebraska. As with all unproductive areas of any size, there's an "explanation" of why there's no production. In the case of the shallow (5,000-ft. deep) Salina basin, one explanation is that it was never a deep depositional trough but rather a comparatively stable area which ended up between two highs, the Central Kansas uplift and the Nemaha granite ridge.

Probably the only reason the Salina basin hasn't produced oil or gas in significant quantities is that there haven't been any holes drilled deep enough in the right places; but, finding the right



places is a tough assignment. Several major periods of uplift and erosion truncated the older rocks of the section and left unconformities between the younger formations, which mask what structure might exist at depth. The very reasons that make the area difficult to work make it attractive.

Chadron arch . . . The broad, southeastward-plunging uparch of pre-Cambrian rocks running northwestward across central Nebraska between the Central Kansas uplift and the Black Hills of Southwest South Dakota is known as the Chadron arch. The Cretaceous-Dakota rocks over this arch are about 1,000 ft. higher than in the Salina basin to the northeast and, due to a westward tilting of the area during Cretaceous time, are several thousand feet higher than in the depths of the Julesburg basin to the southwest.

North of the Kansas line, which is about where the Arbuckle wedges out, Pennsylvanian rocks lie directly on the pre-Cambrian rocks along the arch. Where this same situation exists on the Central Kansas uplift several fields have produced from pre-Cambrian rocks, apparently from fractures or a deeply weathered surface.

Some geologists credit nearly all of the oil on the Central Kansas uplift to Pennsylvanian rocks regardless of where it is now found. The occurrence of oil in pre-Cambrian rocks where in contact with Pennsylvanian rocks certainly cannot be overlooked as a supporting argument for this theory. Wildcats drilling on the Chadron arch should consider the upper 50 ft. or so of the basement a potential reservoir rock.

There have been far fewer dry wildcats drilled in the Salina basin than in any proved oil-producing area of comparable size. It may be an area that will be heard from before long.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

MONTANA . . . The Texas Co. has tested 5,300 ft. of oil in addition to oil-cut water cushion on drill-stem test at 1 Ekland, C NE NW 26-17n-53e, Deer Creak area wildcat along the north end of the Cedar Creek anticline, Dawson County.

COLORADO . . . Twin Oil Co. has completed the Roggen area discovery, 2 Cuykendall, NW NW SW 12-2n-63w, Weld County, for 288 bbl. of oil per day from the "J" sand. This discovery is the most centrally located well in the Denver-Julesburg basin to date.

OKLAHOMA . . . Carter Oil Co. et al. may have a new oil pay at South Salon pool, Ellis County, northwestern Oklahoma. The indicated zone opener and 1-mile south extension to the gas-distillate area opened last year is 1 Irwin, C NW SE 27-23n-24w. Discovery flowed gas and oil from the Pennsylvanian big lime at 7,192-7,203 ft.

MISSISSIPPI

Chickasaw Wildcat Testing

In Chickasaw County, Mississippi, approximately 11 miles northwest of Muldon gas field, testing has been under way at Carter Oil Co. 1 Clem Baskin heirs, Section 19-14s-5e. This wildcat was drilled to total depth of 5,187 ft., then plugged back and casing was set at 4,301 ft. to test shows of gas in the Carter sand zone which was picked on log at 4,300-60 ft. Rotary rig was moved off and cable tools were moved in for testing operations. After cement was drilled out, the well unloaded water load and was then shut in. After being shut in for 14 hours, pressure built up to 1,625 psi. The sand was later washed with 1,000 gal. mud acid and 1,000 gal. of diesel fuel. After this treatment the well was cleaned to pits on ⅜-in. choke with tubing pressure only 159 psi. It is reported that gas flow was at the rate of 564 M.c.f. per day. No estimate was made of the amount of amber condensate which was produced along with the gas. It is reported that operators are preparing to give the sand a fracture treatment in an attempt to increase the rate of flow.

In Monroe County, Mississippi, approximately 12 miles east and 3 miles south of Muldon field, Zack Brooks 1 Benefield, Section 32-15s-18w, cared sand with good stain, odor, taste, and solid bright florescence at 5,092-5,115 ft. in what is thought to be the Sanders zone of the Chester. Average permeability was 50 millidarcys, porosity 10 per cent. oil saturation 13 per cent, and water saturation 9-10 per cent. Drill-stem test was run 5,029-5,119 ft., but recovery was only 120 ft. of salt water-cut mud and 2,380 ft. of salt water. Another test was run using straddle packers at 5,092-5,102 ft. to test only the top 10 ft. of sand. Again recovery was only 120 ft. of salt water-cut mud and 1,180 ft. of salt water. Hole was drilled to 5,140 ft. and log was run. Operators are now drilling ahead, but it has not been decided how deep this hole will be drilled. It is reported that this test is approximately 1,700 ft. lower structurally than the Feazel 1 Rea, located approximatelp 6 miles northeast of Section 12 of same township.

In northwestern Adams County, Mississippi D. Gammill-L. Cashion Co. 1 Ida Stowers et al, Section 8-8n-2w, has been completed as a weak Wilcox discovery. On completion test this well pumped 53 bbl. of 36°-gravity oil plus 75 per cent salt water per day. Completion is from perforations 5,637-38 ft, opposite Wilcox sand. Sidewall cores had carried shows at 5,637-41½ ft. This test had been drilled to total depth of 6,617 ft. and casing was set at 5,691 ft. Testing operations had been underway since the first week in January.

MISSISSIPPI SUCCESSFUL WILDCAT

Adams County: D. Gammill-L. Cashion Co. 1 Ida Stowers et al, Sec. 8-8n-2w, TD 6,614 ft., PT 53 bbl. of oil in 24 hours, 36°-gravity oil.

MISSISSIPPI WILDCAT FAILURES

Adams County: Gulf Refining Co. 3 G. W. Armstrong, Sec. 5-4n-3w, TD 6,875 ft., dry.

B. Serio 1 Schuchardt, Sec. 56-7n-3w, TD 6,109 ft., dry.

Franklin County: B. Serio-Justiss-Mears 2 Homochitto Lumber Co., Sec. 36-6n-1e, TD 7,008 ft., dry.

B. Serio-F. H. Shortridge 1 U.S.A., Sec. 12-5n-2e, TD 7,027 ft., dry.

Jefferson County: D. Gammill-L. Cashion Co. 1 Viola Smith et al, Sec. 72-9n-1w, TD 6,510 ft., dry.

Wilkinson County: B. Serio-Norman Germany 1 Elwyn Carter, Sec. 3-3n-2w, TD 7,506 ft., dry.

Yazoo County: Carter Oil Co. 1 Louis A. Cary, Sec. 3-12n-3w, TD 13,135 ft., dry.

FLORIDA WILDCAT FAILURE

Escambia County: Sunnyland Contracting Co. 1 J. A. Abbott, Sec. 19-3n-32w, TD 7,512 ft., dry.

SOUTH LOUISIANA

Calcasieu Test Awaits Orders

The California Co. has drilled the 1 C. F. Hamburg in southwest flank area of the Lockport dome in Calcasieu Parish to the salt cap and is waiting on orders at total depth of 9,983 ft. Wildcat, located in Section 8-10s-9w, had protection string set to 7,422 ft. Point at which salt was encountered was not learned. Meanwhile, The California Co. has completed another test in the east extension area of Calcasieu Parish's English Bayou (Gillis) field. New producer, 1 John P. Breaux in Section 8-9s-7w, was drilled to 11,500 ft., set 7-in. casing to 10,092 ft., flowed 575,000 cu. ft. of gas daily on 10/64-in. choke with spray distillate. It is shut-in pending state potential. Completion interval is in new pay from 9,710-722 ft.

Tide Water Associated Oil Co. has pulled core at 12,554-64 ft., recovering 10 ft., of which 50 per cent was shale and 50 per cent sand with gas odor. Test is the 1 Southdown Sugars 2 miles northwest of Houma gas field in Terrebonne Parish. Wildcat spots in Section 101-17s-17e, having a projected depth of 13,000 ft.

Shell Oil Co. cemented protection string in the 1 State Lease 2077, another Terrebonne Parish wildcat, and is drilling ahead. Pipe was cemented to 11,003 ft. and drilling has been resumed to fulfill a 12,750 ft. contract which is owned by Gulf Coast Drilling Co. operating from New Orleans.

The California Co. has drilled the 1 Calco-Phillips-City of New Orleans to total depth of 12,815 ft., bottomed in salt and is waiting on orders. This wildcat, located in Section 23s-22e, Lafourche Parish, ran log to total depth of top of salt believed to be near 10,290 ft. It locates in the North Bay March-and area.

W. T. Burton has drilled the 9 Simoneaux in Bayou Des Allemands field of St. Charles to total depth 14,128 ft., establishing deepest test for the field to date, and has run a liner to perforate and attempt completion for a deep sand near 13,000 ft. Test is located in Section 12-15s-20e, on the northwest flank of production. A string of 7-in. casing is cemented to 12,107 ft., 5½-in. liner set to 13,177 ft. Production in the field at present time is found in the Miocene sands between 5,500 and 10,200 ft.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Calcasieu Parish: The California Co. 1 John P. Breaux et al, Sec. 8-9s-7w, TD 11,500 ft., PT 523,000 cu. ft. of gas per day on 16/64-in. choke.

SOUTH LOUISIANA WILDCAT FAILURES

Beauregard Parish: Bateman Drilling Co. 1 Edgewood Land & Logging Co., Sec. 31-6s-10w, TD 7,000 ft., dry.

Jeff Davis Parish: Pan Am Southern Corp. 1 Thibodeaux et al, Sec. 6-10s-4w, TD 10,698 ft., dry.

Lafourche Parish: The California Co. 3 W. A. Jones et al 1, Sec. 33-16s-22e, TD 12,050 ft., dry.

Plaquemines Parish: The California Co. 1 Lilian T. Haeuser et al Unit, Sec. 30-20s-29e, TD 12,492 ft., dry.

St. Helena Parish: Shell Oil Co. 1 Robertson, Sec. 16-3s-6e, TD 10,002 ft., dry.

OKLAHOMA

New Pay Stirs Activity In Carter County Field

New development in the long-inactive old Caddo field, in Carter County, southern Oklahoma, is assuming active proportions and resulting in a succession of good wells, both in the original Hunton pay zone and in the newly opened Springer sand, principal objective of the new activity.

Discovery well of the Springer sand is now being completed by Beach & Talbot at their 1 Pruitt, NW SW SE 23-3s. Producing from two zones, the lower perforated at 2,916-29 ft. and the other at 2,808-30 ft., it flowed 800 bbl. in 8 hours.

A quarter mile to the northwest, Bay Petroleum Corp. is completing its 1 Taylor, SE NW SW 23-3s-1e, in both the Chimney Hill (Hunton) and Springer horizons. From the Chimney Hill, opposite which casing is perforated at 4,277-92 ft., it flowed 65 bbl. of oil per hour through open 2-in. tubing. From Springer, perforated at 2,784-830 ft., it flowed 20 bbl. of oil per hour for 2 hours; then swabbed 258 bbl. in 24 hours. It had been drilled to a total depth of 4,365 ft.

In the meantime, E. L. Johnson has a new Hunton well at his 1 Black, SW NW NW 36-3s-1e, 1½ miles to the southeast. From casing perforations at 4,753-58 ft. and 4,766-74 ft., it flowed 7 bbl. of oil per hour for 18 hours. Total depth is 4,835 ft.

Three additional wells already are being started, one by Beach & Talbot at 2 Pruitt, a location southeast of their Springer discovery well, and two by Bay Petroleum Corp., its 1 Pruitt, east offset to its 1 Taylor, and 1 Carter, east offset to the latter and a northwest offset to Beach & Talbot's Springer discovery.

Cimarron Gas Discovery Indicates Sizable Flow

Information just released by Coltexo Corp. on its 1 Purdy, recently completed gas discovery well in northeastern Cimarron County, westernmost of Oklahoma's panhandle counties, verifies early reports, substantiating beliefs that an important new gas-producing area has been uncovered.

Company information credits the well with an open-flow capacity, calculated on the basis of a 1-hour test, of 33,576,000 cu. ft. of gas per day from upper Morrow (basal Pennsylvanian) sand, opposite which casing is perforated at 4,240-53 ft. Shutin pressure gaged 1,090 psi. Total depth was given as 5,061 ft. with 5½-in. casing at 4,663 ft.

Previous drill-stem tests of Keyes sand, main producing horizon of the Keyes district, 6 miles to the southwest, indicated a flow rate of 2,000,000 cu. ft. of gas per day. This gas contained 2½ per cent helium. Top of the Keyes sand was given at 4,550 ft. Other key tops listed were Morrow zone, 4,120 ft., and Mississippian Chester, 4,603 ft., with surface elevation of 3,697 ft.

The discovery, now designated as the North Sturgis field, is 5 miles north and 3 miles west of the town of Sturgis. It is less than 2 miles south of the Kansas (Morton County) line, about 5 miles from the the Texas county (Oklahoma) line, to the east, and approximately 15 miles west of nearest production of the Hugoton gas field. Spot location of the well is in the C NW SE 20-6n-9eCM.

The same company, an affiliate of Columbian Fuel Corp., is starting its second well, located slightly more than ¾ mile to the east in Section 19. Cities Service Oil Co. has a test under way 3½ miles to the southeast in the NE NE SW 2-5n-9eCM.

Second Pay Horizon for New Ellis County Field

Carter Oil Co.'s second test for the unitized South Salon field in northern Ellis County, in far-western Oklahoma has found promising indications of oil and gas production in the Pennsylvanian big lime zone, a somewhat shallower potential pay than the Morrow horizon (lower Pennsylvanian), in which its discovery well, a mile to the north, was completed last May as a gas-distillate producer. The latter well, 1 Rosendale, did not log any showings of consequence in the shallower zone.

The second test, 1 Irwin, spotted in the C NW SE 27-23n-24w, logged top of the big lime section at 7,191 ft. First drill-stem test with bottom of the hole at 7,203 ft. got a gas flow within 15 minutes after the tester was opened, and filled 640 ft. of 39.2°-gravity oil plus 50 ft. of mud. Tester was open 4 hours. Flowing pressure was 375 psi., and shutin pressure 2,700 psi. Another test, with bottom at 7,238 ft., is being run as this is written.

The discovery well was drilled to a total depth of 9,806 ft., logging top of its Morrow producing zone at 8,400 ft., and the Mississippian Chester, which also carried some gas and oil showings, at 8,548 ft. The Morrow pay produces from a casing-perforated interval of 8,455-8,510 ft.

The field, remotely located in the heart of the Anadarko basin, is Ellis County's first, and so far only production.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Vickers Petroleum 1 Furguson, SE SW SW 6-1n-2w, flowed 196 bbl. of 40.5°-gravity oil from basil Bromide 10,434-509 ft., TD 10,986 ft. PBTD 10,566 ft.

Logan County: D. F. O'Rourke and Sunray Oil Corp. 1 Ferguson Est., SE SE NW 23-16n-1w, flowed 31 bbl. of oil from Misener 5,247-56 ft., TD 5,725 ft. PBTD 5,260 ft.

Pottawatomie County: W. T. Fail 1 Waller, SE SW SE 25-10n-4e, pumped 150 bbl. of oil from dolomite 4,393-4,412 ft., TD 4,436 ft. (new pay at West King pool).

Sterling Oil Co. of Oklahoma 1 Youngblood, SE SE NW 11-11n-4e, pumped 35 bbl. of oil from unconformity sand 4,782-4,801 ft., TD 4,835 ft.

Texas County: Cities Service Oil Co. 1 Stonebraker "Y," SE SE NW 29-2n-12eCM, flowed 26,600 M.c.f. of gas from 2,644-52 ft., TD 6,950 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: Ace Oil Co. 1 Hooper, NE SW NW NE 2-5s-11w, dry, TD 2,170 ft.

Garvin County: Northern Pump 1 Graham-Baker, NE NW SW 11-3n-1w, dry, TD 5,555 ft.

Latimer County: Holland & Barnes 1 McCoy, SW NE SW 8-4n-20e, dry, TD 850 ft.

Lincoln County: Gulf Oil Corp. 1 Haas heirs, NW SW SW 3-13n-2e, dry, TD 5,532 ft.

James S. Wise 1-A Ryel, SW NE SW 10-15n-2e, dry, TD 5,254 ft.

Foster Drilling Co. and Blackwell Oil & Gas Co. 1 Anderson, SE SW SW 18-16n-4e, dry, TD 4,826 ft.

Logan County: R. M. Jordan 1 Taylor, SW SW SE 1-15n-1w, dry, TD 5,856 ft.

Murray County: Anderson-Prichard Oil Corp. 1 Jones, SW NE NW 1-2s-3e, dry, TD 2,021 ft.

Pawnee County: D & L Oil Co. 1 Huffington, SE SE SW 12-20n-5e, dry, TD 3,274 ft.

Pontotoc County: Arkwells Corp. 1 Sherwood O'Neal, SE SE SE NE 7-1n-7e, dry, TD 1,794 ft.

Earl A. Tarver 1 Busby, SW NE SW 9-4n-8e, dry, TD 805 ft.

CALIFORNIA

Deeper Pays Added to Old Shallow San Joaquin Fields

West-side San Joaquin Valley's old shallow oil fields continue to yield deeper oil zones. Most recent was that of Standard Oil Co. of California in Midway field 2 miles south of Taft, SW SW 29-33s-24e.

Drilled to 6,879 ft., its 27 29-D was in process of being completed at the plugged back depth of 5,321 ft. Production was through 43 ft. of perforations below the 7-in. casing string, cemented at 5,290 ft. When the famous Lakeview sands, Upper Miocene, were being developed about 40 years ago, nearby wells completed in the shallower pay flowed as much as 10,000 bbl. daily.

Two new wildcats were staked in the Edison area southeast of Bakersfield. In NW SW 8-38s-29e, ¾ mile west of Crown Drilling Co.'s recent Jeppi-Camp 5,800-ft. new pool discovery, C. F. Catalano and T. W.

KINZBACH POLISHED ROD STUFFING BOX

POSITIVE SEAL OFF
SELF ALIGNING
SAFE
ECONOMICAL

Kinzbach Polished Rod Stuffing Boxes are plastic packed, have a floating, self-aligning gland and hold positive seals under the toughest conditions. Packing may be added and seal tightened easily without shutting in the well. Available in all popular sizes of polished rods.

KINZBACH TOOL CO INC

KINZBACH TOOL CO., INC.
P. O. BOX 277 HOUSTON, TEXAS
Export Office: 74 Trinity Place, New York, N. Y.

Are your OIL INVESTMENTS
Closely Held or
Family Owned?

We specialize in the making of oil loans and advising on the financial problems of independently owned oil and gas producing properties.

C. LESLIE RICE, JR. — *Vice President*
J. F. DOUGHERTY — *Vice President*

Oil Department

Empire Trust Company
7 WEST 51st STREET
at Rockefeller Center, New York, N. Y.

*From the popular GSI safety training film, "Make No Mistake"**

THE MEN

who search for FACTS . . . for you

To give you the best possible production at lowest possible cost, GSI stresses efficient crew operation. Careful planning underlies each exploration program GSI conducts for you. Crew members — the men who serve you — are trained to adapt intelligently the basic plan to their observations and evaluations. GSI Party Chiefs are experienced men who use the greatest degree of technical excellence in securing and translating seismic data into an accurate subsurface picture. GSI gives you the men who find the facts . . . efficiently.

GEOPHYSICAL SERVICE INC.

6000 LEMMON AVENUE • DALLAS, TEXAS

**Available on request for showing to your organization.*

Stansbury will drill 16-8 Drury. North of Edison Groves and about mid-way to Kern Bluff field, Richfield Oil Corp. staked 1 Tracey in SE NW 20-29s-29e.

Three other San Joaquin Valley wildcats started were Chanac Associates 2 Chanac in 6-11n-17w, east of Tejon Hills production; Oceanic Oil Co. 1 Phelps-Loukonen in 12-32s-22e, in the north Spellacy area of San Luis Obispo County; and Gene Reid Drilling, Inc. 1 Giannini in the Kingsbury area of Tulare County. The latter, in NW NW 17-16s-23e, will be a 4,000-ft. test on a 9,000-acre block held by the operator.

In Cuyama Valley, Richfield was preparing to start a ¼-mile southeast extension to its new fault-block discovery on the southeast end of Russell Ranch. At Ballinger Canyon on the southeast end of the valley, General Petroleum Corp. 14-4 Clayton, 4-9n-24w, was drilling below 5,600 ft. In 28-9n-26w, southeast of the South Cuyama field, Superior Oil Co. 2 Cuyama-Government was nearing 3,000 ft.

Guadalupe field, adjacent to the Pacific Ocean in San Luis Obispo County, shortly will be given a 1-mile northeast extension attempt by Thornbury Drilling Co. The wildcat, 2-75 Union Sugar, will seek the Sisquoc and Knoxville sand pays being developed in the field.

In the Orcutt area, Santa Barbara County, two attempts to find deeper production were failures. Union Oil Co. plugged back 18 Dome, 24-9n-34w, for completion in the regular 3,200-ft. pay after drilling to 11,639 ft. Los Nietos Co. 25-11 Los Nietos-Gulf in Section 11 was abandoned after failing to find commercial production in drilling to 9,437 ft.

Whether or not The Texas Co. 1 Hunter will extend deep Sespe zone ¾ mile west at Torrey Canyon, Ventura County, should shortly be known. Although the wildcat was running somewhat lower than Union Oil Co.'s wells, it was nearing the 9,700-mark and deepest field wells have been bottomed above 11,000 ft. after cutting 1,000 ft. or more of pay zone. In the field Union was completing two new Sespe wells and its 92 Torrey, scheduled to go to around 14,000 ft., was drilling at 3,900 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Tejon Hills area: Wa-Me-Co Drilling Co., Inc. 4 White Oak, 7-11n-17w, dry, TD 491 ft., elev. 924 ft.

Orange County, Buena Park area: The Texas Co. 1 Mills, 36-3s-11w, dry, TD 6,220 ft., elev. 89 ft.

West Newport area: Solana Oil Co. 2 Solana, 12-6s-11w, dry, TD 5,714 ft., elev. unreported.

Sacramento County, Freeport area: Standard Oil Co. 2 Simms Comm., 18-7n-5e, dry, TD 9,419 ft., elev. 15 ft.

San Diego County, Oceanside area: Grober & Associates 1 Perry, 33-12s-4w, dry, TD 1,865 ft., elev. 284 ft.

Santa Barbara County, Orcutt area: Los Nietos Co. 25-11 Los Nietos-Gulf S.S.T., 11-9n-34w, dry, TD 9,437 ft., elev. 336 ft.

Ventura County, Santa Paula Creek area: Richfield Oil Corp. 2 McCloskey, 22-4n-21w, dry, TD 8,140 ft., elev. 1,728 ft.

LEGAL

SEALED BIDS will be received until 2:00 p.m. PST, March 20, 1953, at the office of the Superintendent, Warm Springs Indian Agency, Warm Springs, Oregon, for the sale of oil and gas mining leases on 5,586.47 acres of trust allotments of the Burns-Paiute Indians in Harney County, Oregon. For further information, address the Superintendent, Warm Springs Indian Agency, Warm Springs, Oregon.

LOUISIANA

Concordia Strikes Again

The stepped-up campaign for Wilcox production in east-central Louisiana which began last year has continued its steady pace into the new year.

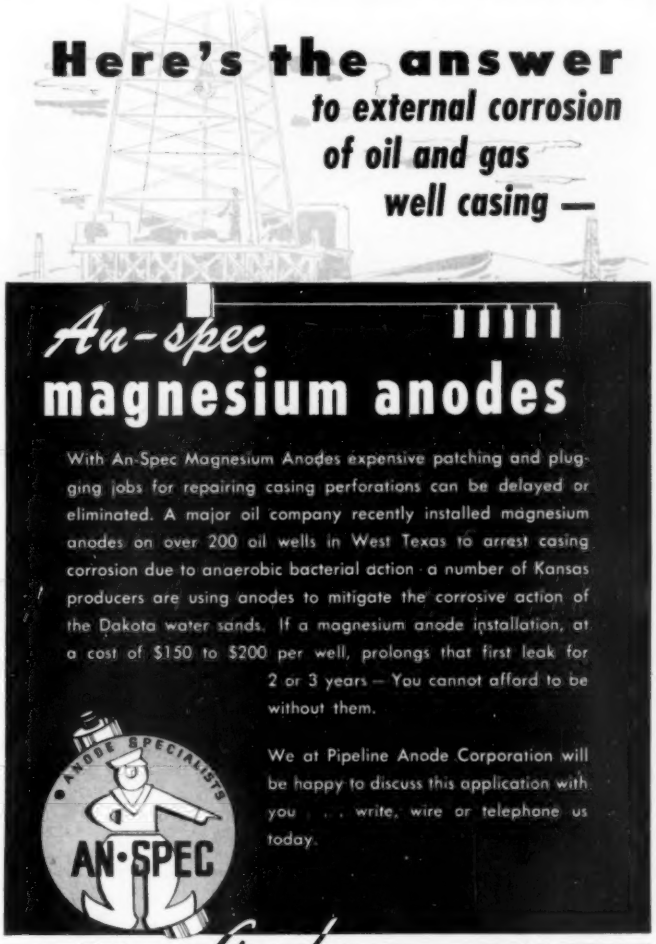
Barnett Serio has completed a ¾-mile northwest extension to Wildsville field, which now has four producing wells, all in the south half of Section 7-7n-7e. The 1 Savage was finaled for 176 bbl. of 42.3°-gravity oil daily from the Wilcox oil sand topped at 5,095 ft. The new extensioner is located in the C NE NE 12-7n-6e.

This section of Louisiana, which lies on the Wilcox trend extending from east to west through central Louisiana into the southwestern counties of Mississippi, recorded the most wildcat tests during 1952. However, only one new field, Ross Bayou, was opened in Concordia Parish. Catahoula Parish, lying just west of Concordia, fared better, however, having five small discoveries, all in the Wilcox. This area lies just west of prolific Adams County, Mississippi, where 13 new Wilcox strikes were made in 1952. There have been two new Wilcox discoveries in that area so far this year.

LOUISIANA WILDCAT FAILURES

Concordia Parish: Kemp Drilling Co., Gulf Refining Co., and Hunt Oil Co. 1 Thomas "A," C NW SE 28-7n-7e, dry, TD 6,022 ft.

Richland Parish: Ed. E. Hurley et al 1 Frank-


Here's the answer
to external corrosion
of oil and gas
well casing —
An-spec
magnesium anodes
With An-Spec Magnesium Anodes expensive patching and plugging jobs for repairing casing perforations can be delayed or eliminated. A major oil company recently installed magnesium anodes on over 200 oil wells in West Texas to arrest casing corrosion due to anaerobic bacterial action - a number of Kansas producers are using anodes to mitigate the corrosive action of the Dakota water sands. If a magnesium anode installation, at a cost of $150 to $200 per well, prolongs that first leak for 2 or 3 years — You cannot afford to be without them.
We at Pipeline Anode Corporation will be happy to discuss this application with you . . . write, wire or telephone us today.
ANODE SPECIALISTS
AN·SPEC
PIPELINE Anode CORPORATION
25th WEST AVENUE AND SAND SPRINGS ROAD
P. O. BOX 996
TULSA, OKLAHOMA
DISTRIBUTORS
PIPELINE SUPPLY COMPANY
2230 Magnolia Street
Birmingham, Alabama
PROTECTO WRAP COMPANY
436 Douglas Blvd
Los Angeles 12, California

lin, C NW SW NE 14-17n-8e, dry, TD 4,555 ft.

Union Parish: American Republic Corp. et al 1 Fee, 20-21n-3e, dry, TD 9,396 ft. (Deep Monroe Smackover test).

ARKANSAS

New Pays for Hibank

Union County's Hibank field reported two new pays, the Hogg sand and the Tuscaloosa.

Hibank field now has production from the Nacatoch, Meakin, Graves, Tuscaloosa, and Hogg sand, ranging in depths from about 2,050 ft. to 3,154 ft.

Murphy Corp. opened Hogg sand production in the field with completion of 1 Lumber in the SW SE NE 24-18s-15w. This is the first Hogg sand production outside of the Stephens area in Ouachita County. The well flowed 125 bbl. of 45°-gravity oil per day. This test missed the other producing sands of the field, and two offsets to the discovery had Hogg shows.

Tuscaloosa production was opened in the field by McAlester Fuel Co., who also opened the field's Graves sand production recently. The 4-A Pendleton, C SE SW NW 24-18s-15w, flowed 24 bbl. of oil per day. Other Tuscaloosa production in Union County is to the west in Schuler field area. This test missed pay in the Meakin and Graves sections.

McAlester was also responsible for opening Meakin pay in the field at 2-A Pendleton, C SW SW NE 24-18s-15w. This hole also found oil pay in the Graves sand, while Lion Oil Co. found Meakin and Graves sands faulted out in their 1 Julia, SE NW NW Section 24, and the hole was dry at 3,072 ft., also failing to find the Tuscaloosa pay.

Hogg sand production comes from perforations at 3,147-54 ft., the Tuscaloosa pay is at 3,054-56 ft., and 3,058-60 ft., while the Graves sand pay is at 2,556-58 ft. The Meakin pay is from perforations at 2,434-36 ft.

At the only other Hogg sand producing area in Arkansas, the new Center field in the Stephens area of Ouachita County, McAlester completed 1-B Morgan, NE NW SW 29-15s-19w, logging oil pay in the Hogg at 3,182-89 ft. The well flowed 141 bbl. of 28°-gravity oil.

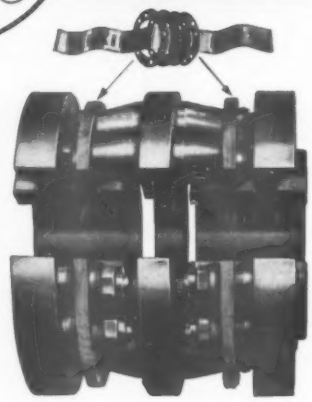
Pan American Corp. added a good oil well at 5 Curry, C SW SE NW 29-15s-19w, south offset to the field discovery. This well flowed 150 bbl. of oil per day from 3,178-84 ft. McAlester has two more wells drilling in the area for Hogg sand production, while Lyons, McCord & Logan are rigging up for a 3,300-ft. Hogg test west of the field discovery.

AVOID COSTLY SHUT-DOWNS!

prolong the life of your machines with Thomas Couplings

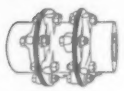
NO MAINTENANCE
NO LUBRICATION
NO BACKLASH
NO WEARING PARTS

THOMAS
THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT



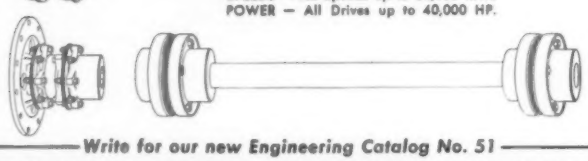
REFINERS! PIPE LINE MEN! DRILLING ENGINEERS! LABORATORY TECHNICIANS!

You can use Thomas Couplings to your advantage on Pumps, Compressors, CoolingTowers, Rigs or any tough job where continuous operation and dependability are required.



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

SPEEDS — All Speeds up to 30,000 RPM.
POWER — All Drives up to 40,000 HP.



Write for our new Engineering Catalog No. 51

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

NEW MEXICO

SOUTHEAST NEW MEXICO

Big Oiler Extends Lazy J. Field

Sinclair Oil & Gas Co. 1-245 State, 28-11s-33e, has extended the Lazy J Permo-Pennsylvanian field ⅝-mile northwest with a completion potential of 726 bbl. of oil. Production was through 24/64-in. choke on perforations at 9,660-69 ft.

Further development in the area of this newly discovered field included locations during the week for two outposts. The Texas Co. will drill 1-BV State to 9,750 ft. in 26-13s-33e, and Sinclair will drill 1-251 State in Section 28. The latter location is ½-mile south of Sinclair's recent west extension.

North of the field, Amerada Petroleum Corp. 1 Tulk prepared to drill-stem test to 9,985 ft., following a test from 9,750-9,856 ft. which recovered gas-cut mud.

Deep Wildcat Plugs Back

Gulf Oil Corp. 1 Federal-General American, Eddy County wildcat in 24-17s-29e, has plugged back from 13,341 ft. to 11,444 ft. for completion attempt. Drill-stem tests in the lower Pennsylvanian at 11,173-271 ft. recovered gas and 55°-gravity distillate.

High-Pressure Gas Hit

Gulf 7-B-1 Matthews, in the Blinebry field of Lea County, struck a high-pressure gas section in Yates limestone around 2,646 ft. and blew out, making a measured 130,000,000 cu. ft. of sour gas daily. Tools were blown from the hole but there was no fire. Ice built up 4 ft. on the derrick floor overnight, and operators were moving out materials preliminary to capping the well.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Eddy County: G. D. Riggs 4 Welch, 4-21s-27e, dry, TD 886 ft.

Stanolind Oil & Gas Co. 1 Lakewood unit, 34-19s-25e, dry, TD 10,486 ft., elev. 3,542 ft., Pennsylvanian 8,150 ft., Mississippian 9,863 ft., Devonian 10,340 ft.

Lea County: Sinclair Oil & Gas Co. 1 Renshaw, 2-14s-36e, dry, TD 13,047 ft., elev. 3,944 ft., Pennsylvanian 10,690 ft., Bend 12,060 ft.

CANADA

Homeglen Test Adds Pay

The Homeglen area discovery well continued to add condensate-bearing natural gas pay zone during the past week, and has not opened up 196 ft. of D3 pay. That wet gas discovery well, California Standard 3-29 Homeglen, LSD 3, 29-43-1w5, flowed natural gas at rates up to 7.5 million cu. ft. daily, and has given condensate recoveries ranging from 30 to 250 ft. Latest tests at the well indicate that the core hole is nearing what may be the end of its wet gas zone, as the gas flow decreased to around 2,000,000 cu. ft. daily, and the condensate recovery has been increasing. Coring and testing is proceeding below 7,751 ft. This well, being drilled by The California Standard Co., is 50 miles southwest of Edmonton and 15 miles from Pigeon Lake Devonian oil wells.

The first 1953 oil discovery in Alberta's northwest region, Shell-Imperial 1 Springburn gave up further encouragement this week, as crew ran a straddle packer test in the Devonian discovery formation. Through a 16/64-in. choke, the Springburn strike flowed approximate 40°-gravity oil at rate of 200 bbl. per day. Test was from 6,791-6,806 ft. That light gravity oil discovery well will run string of production casing for further evaluation tests. Indications are that it will shape into a substantial oil producer for that Peace River region. Site is in LSD 14, 34-80-17w5, around 200 miles northwest of Edmonton and 63 miles northeast of Amerada's Sturgeon Lake Devonian oil discovery well that was drilled in 1952.

This week Union Oil Co. of California was assured of 40 ft. of D3 Devonian oil pay zone, and then entered formation water, at its Fairydell wildcat in the Legal region, some 20 miles north of Edmonton. That venture, a dual zone Devonian oil strike, also encountered D2 oil earlier this year. D3 porosity was found to be present, free of water, from 4,015-55 ft. Gravity of the oil is 25°. Production string of casing has been run at the well, and hole is being readied for further tests. Site is LSD 3, 21-57-24w4.

Anglo-American Exploration, Ltd.'s central Alberta wildcat near Halkirk, this week blew as it was testing in the Lower Cretaceous sands, at 3,795 ft. The blow-out was brought under control almost immediately, and well is now running further drill-stem test in an effort to evaluate the well's gas strike. Site is LSD 9, 28-39-16w4, on farmout from Canadian Superior Oil of California, Ltd., 120 miles northeast of Calgary.

Sohio Petroleum Co. group was assured of its first commercial oil production in Saskatchewan this week, when its extension venture in the Wapella area gave up an oil recovery of over 2,000 ft. during drill-stem test in the Lower Cretaceous sands.

The new oil well, Sohio 10-34 Wapella, LSD 10, 34-14-1w2, lies slightly over ½ mile southeast of other production in the area and ¾ mile southeast of the discovery well at Wapella. An approximate 25 ft. section was drill-stem tested down to around 2,240 ft., and pipe recovery was 2,050 ft. of clean oil. Gravity of the oil is approximately 27°, comparable to that at the discovery well in the area.

The north offset to the Erskine area D3 Devonian oil discovery well, after contacting D3 about 25 ft. higher than the discovery, ran drill-stem test in the gas cap—with flow rate in excess of 9 million cu. ft. daily, and then tested in the oil column—receiving an estimated flow rate of 50 bbl. hourly.

The new oil producer is Merrill-Mitmor 12-1 Merland & associates, LSD 12, 1-39-21w4, ¼ mile north of the discovery. D3 reef came in at 5,305 ft., or 2,617 ft. subsea. Latest drill-stem test, from 5,360-70 ft., was run for 25 minutes. Natural gas flowed immediately and reached rate of 2,190,000 cu. ft. daily in 10 minutes. Gas flow died in 13 minutes and oil flowed in 15 minutes, at estimated rate of 50 bbl. per hour. Crew is running production casing.

ALBERTA SUCCESSFUL WILDCATS

Bay 6-11 South Camrose, LSD 6, 11-46-20w4, TD 5,225 ft., PB 3,317 ft., Viking oil well.

Grassy Lake 1 Glenphyll, LSD 7, 10-11-13w4, TD 3,085 ft., Ellis oil well.

Marwayne-Dragon 5-29, LSD 5, 29-43-13w4, TD 3,479 ft., Lower Cretaceous gas well.

West Nevis 10-8, LSD 10, 8-39-22w4, TD 5,951 ft., gas well (Devonian).

Steveville Developments 4, LSD 6, 4-23-11w4, TD 2,519 ft., Viking oil well.

Imperial 3-15 Wildunn, LSD 3, 15-29-14w4, TD 4,627 ft., Viking gas well.

ALBERTA WILDCAT FAILURES

Brinkenhoff-Brown 13-14 Beaverhill Lake, LSD 13, 14-51-18w4, TD 3,925 ft.

Husky 1 Durness, LSD 2-26-51-1w4, TD 2,270 ft.

Merrill-Kenwell-Amerada 7-18, LSD 7, 18-47-16w4, TD 4,450 ft.

Stanolind 1 Loon River, LSD 16, 23-90-11w5, TD 5,320 ft.

Cal-Standard-Gulf 11-3 Rimbey, LSD 11, 3-42-2w5, TD 7,893 ft.

Mail this coupon

Oil & Gas Dept., The Royal Bank of Canada, Calgary, Alta.

Please send me the bulletins I have checked off below.

- ☐ Regulations—Leases & Reservations—Alberta
- ☐ Regulations—Leases & Reservations—Saskatchewan
- ☐ Regulations—Leases & Reservations—British Columbia
- ☐ Regulations—Leases & Reservations—Manitoba
- ☐ Conservation & Proration
- ☐ Western Canada Petroleum Association
- ☐ Structure of Federal & Provincial Govts.
- ☐ Business Operations in Canada
- ☐ Minimum Wages & Holidays with Pay
- ☐ Tariffs & Customs Regulations
- ☐ Royalty Payments to the Crown
- ☐ Natural Gas (Reserves, export policy)
- ☐ Oil Financing—the Bank's role
- ☐ Immigration
- ☐ Taxation
- ☐ Trust Companies' Functions —Royalties explained
- ☐ Industry Statistics
- ☐ Stamp Tax on Cheques

Name .....

Position .....

Company ..... *State* .....

Address .....

City .....

Special Bulletin Service

TO KEEP YOU UP TO DATE ON

Canada's Oil and Gas Industry

The attention of oil men the world over has been attracted to the rapid development of the Canadian oil and gas industry.

Because regulations and procedures are subject to frequent change, our Oil & Gas Department has inaugurated a unique *Special Bulletin Service*, designed to furnish *current* information on various topics. Bulletins are revised as circumstances warrant.

To secure any of these bulletins, together with a handy file folder, use the coupon above.

NEW YORK AGENCY: 68 William St., N. Y. 5

HEAD OFFICE: MONTREAL

THE ROYAL BANK OF CANADA

TOTAL ASSETS EXCEED $2,500,000,000

Great Plains-Sharples 7-2 North Rochester, LSD 7-2-63-24w4, TD 4,158 ft.
Williams Creek 1-19 Baysell, LSD 1, 19-31-6w5, TD 7,535 ft.

SASKATCHEWAN WILDCAT FAILURES

Calvin - Canadian Devonian - Imperial 11-23, Jackpot Lake, LSD 11, 23-8-26w3, TD 6,288 ft.
Canada Southern 7-2 Onward NE, LSD 7, 2-34-24w3, TD 2,830 ft.

BRITISH COLUMBIA WILDCAT FAILURE

Wilrich-Trans Era-Central-Del Rio 1 Stony Lake, 54° 50 ′ N Lattitude, 120° 38 ′ W Longitude, TD 5,835 ft.

MANITOBA WILDCAT FAILURE

Baysel-Cal Standard 3-20 Boissevain, LSD 3, 20-3-19w1, TD 2,690 ft.

TEXAS

EAST TEXAS

Extension Test Set for North Lansing Field

American Republics Corp. will drill another north extension test to the North Lansing gas field southwest of Harleton in Harrison County. Operations were under way at 1 Bosch Unit, Benjamin Parker Survey, which lies about 1 mile north of the firm's 1 Scott-Bosch Unit.

The latter well completed as a 1-mile north extension to the Young zone production at 6,865-6,893 ft.

In Houston County, Carter-Jones Drilling Co. 1 G. L. Richards is being drilled as a 6,200-ft. wildcat. Location is 2 miles east of the Navarro Crossing field in the John La Riviere Survey.

Harold Hoffman, R. E. Niblock, and James Crosby, all of Dallas, were reported planning to drill 8 wells on the W. Olson Estate 200-acre tract in the J. Broyles Survey, Navarro County. Waterflood operations in the old Powell field brought about the new work.

EAST TEXAS (DISTRICTS 5 AND 6) SUCCESSFUL WILDCAT

Harrison County: Humble Oil & Refining Co. 1 L. R. Keith, Aaron Poe Sur., 2 miles E Scottsville, 8D 6,609 ft., perforated Rodessa 5,301-24 ft., IP 281 bbl. 42°-gravity oil, ¼-in. choke, TP 190 psi., GOR 77 cu. ft.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Leon County: Allerton Miller 1 S. L. Leathers, Ramon de la Garza Sur., A-8, dry, TD 7,044 ft.
Van Zandt County: Jackson and Deupree 1 J. B. Roberts, John Jackson Sur., 5 miles S Wills Point, dry, TD 5,977 ft.

"By all calculations, 'tis the block wi' the flexible in mind."
McKISSICK
SAFETY FLOOR BLOCK
For Flexibility
Latch Type Becket may be "latched" into tie-down without removal from block.
Also available with patented adaptor and base plate, permitting block to sway laterally with line movement.
A BETTER BLOCK FOR EVERY PURPOSE
McKISSICK
McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

NORTH TEXAS

Montague County Has New Caddo Prospect

Bay Petroleum Corp. 1 Ford, 4 miles south of Bowie in the I. Garner Survey, A-287, has shown for discovery production from Caddo limestone. Drill-stem test at 5,964-72 ft., open 1 hour and 15 minutes, recovered 252 ft. of oil. A second test at 5,971-98 ft. recovered drilling mud. Operators were installing a pump for production tests.

Location of the new well is 1½ miles southeast of similar production, but separated by dry holes.

Coleman County had two discoveries in completion stage, one showing oil and location made for an extension try.

Hovgard & Fitzgerald 1 Mrs. Eulys Johnson, 91-2-GH&H, 8 miles northeast of Silver Valley, made a daily potential of 316 bbl. of 44°-gravity oil through 16/64-in. choke. Pay section in Gray sand was perforated from 3,163-71 ft.

Ada Oil Co. 1 J. E. Moore, Block 21, Hopkins CSL, A-176, pumped 66 bbl. of oil a day from perforations at 4,619-36 ft. after fracturing the sand. Pay section is in the lower Pennsylvanian and location is 2 miles southwest of Blue Grove.

New prospect for the county, in the Morris sand, was Cree Oil & Exploration Co. 1 Sealy - Smith Foundation, 65-2-GH&H, 6 miles northeast of Silver Valley. Operators set pipe at 2,582 ft. after recovering 120 ft. of oil-cut mud on a 2-hour test from 2,538-50 ft.

Location was staked for George Burns 1 Annie Davis in Block 71, J. H. Belcher subdivision, 1 mile southwest of Deer Creek and about ¾-mile south of present production. Contract depth was 4,500 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Callahan County: Theo. Hamm Brewing Co. 1 Mrs. E. C. Harwell, Sec. 307, Julian Smith Sur., TD 4,100 ft., elev. 1,671 ft., pay 4,080 ft., IP pumped 35 bbl. 42°-gravity oil.
Coleman County: Miami Operating Co., Inc. 1 Mike Parker, 31-2-T&NO, TD 3,880 ft., elev. 2,007 ft., pay 3,841 ft., IP pumped 69 bbl. 42°-gravity oil.
Miami Operating Co. 1 Whitley, 26-2-T&NO, TD 3,860 ft., elev. 2,065 ft., pay

3,825 ft., IP 180 bbl. 41°-gravity oil, 12/64-in. choke, TP 640 psi., GOR 1,944 cu. ft.

H. M. Naylor Oil Co. 1 S. N. Payne, Sec. 309, G. W. Morgan Sur., TD 3,521 ft., elev. 2,022 ft., pay 3,389 ft., IP 552 bbl. 44°-gravity oil, 20/64-in. choke, TP 330 psi., GOR 660 cu. ft.

Eastland County: McElroy Ranch Co. 1-B Wright, 3-3-H&TC, TD 3,796 ft., elev. 1,544 ft., IP 6,000,000 cu. ft. of gas.

Grayson County: L. O. McMillan 1 Suddath Bros., M. S. Utzman Sur., TD 8,781 ft., elev. 699 ft., Strawn pay 6,604 ft., IP 100 bbl. 38°-gravity oil, ⅞-in. choke, TP 225 psi., GOR 350 cu. ft.

Haskell County: Mid-Continent Petroleum Corp. 4 L. F. Taylor, 31-1-H&TC, TD 5,330 ft., elev. 1,621 ft., pay 5,022 ft., IP 216 bbl. 40°-gravity oil, 20/64-in. choke, TP 225 psi., GOR 327 cu. ft.

Jones County: W. E. Butler 1 Shelton, Sec. 17, D&DAL Sur., TD 5,417 ft., pay 2,254 ft., IP 147 bbl. 40°-gravity oil in 17 hours.

Onyx Oil Co. et al 1 J. H. Doty, Sec. 42, OAL Sur., TD 1,903 ft., pay 1,897 ft., IP 164 bbl. 40°-gravity oil in 12 hours, ½-in. choke, TP 150 psi., GOR 634 cu. ft.

Palo Pinto County: E. J. Muth 1 Bert Slemmons, 52-3-T&P, TD 1,564 ft., elev. 1,241 ft., pay 1,476 ft., IP 47 bbl. 38°-gravity oil.

Shackelford County: Marshall R. Young 1 Dell Newell, Sec. 86, ETRR Sur., TD 3,178 ft., elev. 1,747 ft., pay 3,169 ft., IP 129 bbl. 42°-gravity oil.

Stonewall County: Bridwell Oil Co. 1-A Alexander, 5-347-Wm. Vardeman Sur., TD 4,924 ft., Canyon sand pay 4,782 ft., IP 191 bbl. 40°-gravity oil, ¼-in. choke, TP 180 psi., GOR 400 cu. ft.

Young County: Ada Oil Co. 1 McKinney, J. Cates Sur., A-1,398, TD 4,815 ft., pay 4,313 ft., IP pumped 64 bbl. 39°-gravity oil.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Pat Fowler 1 T. V. Carr, Sec. 2,437, TE&L Sur., dry, TD 1,144 ft.

G. W. Graham and Wm. McCluskey 1 E. E. Threet, Sarah Williams Sur., A-786, dry, TD 4,317 ft.

S. F. Hutcheson 3 C. S. Morris, Wm. Henry Sur., dry, TD 1,347 ft.

Reno Oil Co. 1 Girlie, Blk. 97, ATNCL, dry, TD 4,283 ft.

Brown County: Anzac Oil Corp. 1 Culberson Est., Sec. 4, ETRR Sur., dry, TD 2,500 ft., elev. 1,558 ft., Mississippian 2,365 ft., Ellenburger 2,418 ft.

Gray Drilling Co. 1 W. J. Haynie & Wife, Sec. 2, J. A. Willis Sur., dry, TD 1,944 ft.

Callahan County: Johnson & Warren 1 Blan Odom, Sec. 229, Wm. E. Pledge Sur., dry, TD 1,043 ft.

Tri-M Production Co. 1 Dyer, Jackson Pre-Emption Sur., dry, TD 4,659 ft.

Clay County: Bay Petroleum Corp. et al 2 L. S. Wright, Sec. 3,295, TE&L Sur., A-656, dry, TD 4,710 ft.

Coleman County: B. Baldridge 1 R. W. Williams, Sec. 629, J. M. Rine Sur., dry, TD 1,370 ft.

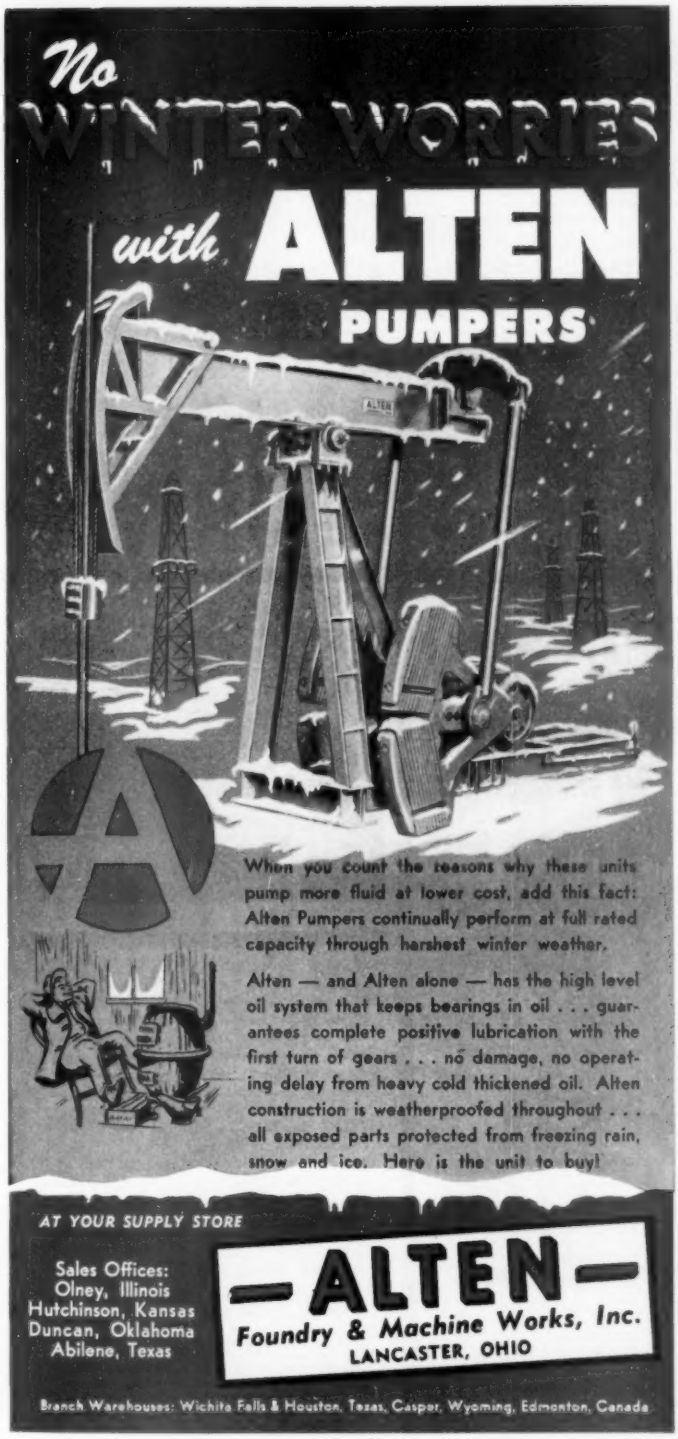
Hack Drilling Co. 1 R. M. Freeman, Sec. 6, W. G. Strickland Sur., dry, TD 3,896 ft.

Rowan & Hope 2 Cecil Horne, Sec. 77, HT&B, dry, TD 3,534 ft.

J. M. West 1 C. W. Pitts, W. Wallingford Sur., dry, TD 4,624 ft., elev. 1,787 ft., Ellenburger 3,500 ft., Wilburn 4,065 ft., Leon Mountain sand 4,488 ft., Hickory sand 4,604 ft.

W. W. Wise 1 Rex Garrett, Sec. 46, T&NO, dry, TD 1,900 ft.

Yeatman Drilling Co. 1 Mary Dunman,


No
WINTER WORRIES
with ALTEN
PUMPERS
When you count the reasons why these units pump more fluid at lower cost, add this fact: Alten Pumpers continually perform at full rated capacity through harshest winter weather.
Alten — and Alten alone — has the high level oil system that keeps bearings in oil . . . guarantees complete positive lubrication with the first turn of gears . . . no damage, no operating delay from heavy cold thickened oil. Alten construction is weatherproofed throughout . . . all exposed parts protected from freezing rain, snow and ice. Here is the unit to buy!
AT YOUR SUPPLY STORE
Sales Offices:
Olney, Illinois
Hutchinson, Kansas
Duncan, Oklahoma
Abilene, Texas
— ALTEN —
Foundry & Machine Works, Inc.
LANCASTER, OHIO
Branch Warehouses: Wichita Falls & Houston, Texas, Casper, Wyoming, Edmonton, Canada

Sec. 112, W. A. Hill Sur., dry, TD 3,803 ft., elev. 1,942 ft., Jennings 3,537 ft., Gardner 3,600 ft., Gray 3,740 ft.

Cooke County: Ralph Harper 1 Richard Harris, Blk. 13, SPRR Sur., A-979, dry, TD 2,880 ft.

Eastland County: Bay Petroleum Corp. et al 1 J. J. Hawkins, Spires Dooley Sur., A-77, dry, TD 3,797 ft., Barnett 3,659 ft., Ellenburger 3,744 ft.

Grayson County: B. M. Hester & Son 1 W. A. Davis, Patsy Kitchens Sur., A-666, dry, TD 5,830 ft.

Haskell County: Gilliam Drilling Co. 1 Martha Gordon, 161-45-H&TC, dry, TD 4,920 ft.

Sid Katz 1-A Mrs. Lee Yater, 24-1-H&TC, dry, TD 5,597 ft.

Knox County: Humble Oil & Refining Co. 1 R. H. Howell, 100-2-D&WRR, dry, TD 6,111 ft., Ellenburger 6,028 ft.

Sunray Oil Corp. 1 Big Four Ranch Co., 22-4-D&WRR, dry, TD 6,365 ft.

Montague County: Bywaters & Matter 1 Fenoglio, H. Frost Sur., A-267, dry, TD 6,831 ft.

S. D. Johnson 3 H. D. Fields, E. Peddycart Sur., dry, TD 2,601 ft.

Star Oil Co. 2 Yarbrough, J. B. Miller Sur., A-460, dry, TD 7,200 ft., elev. 1,207 ft., Caddo 6,220 ft.

Nolan County: Roark, Hooker & Hill 1 L. W. Ross Sec. 287, J. Clarke Sur., dry, TD 5,697 ft.

Palo Pinto County: W. B. Boling 1 Edna Crumpton, J. Karcher Sur., A-279, dry, TD 2,631 ft.

O. G. Spratt 1 J. W. Watson, 15-3-T&P, dry, TD 1,804 ft.

Shackelford County: Jones & Stasney 1 Walker-Buckler-Walker Shelton Trustee, Sec. 137, TE&L Sur., dry, TD 3,160 ft.

Sojourner Drilling Co. 1 Alice Walker, 74-13-T&P, dry, TD 4,884 ft.

Stonewall County: Bridwell Oil Co. 4 J. M. Alexander, 348-6-Austin & Williams Sur., dry, TD 4,350 ft.

Taylor County: C. M. Ashby 1 J. C. McCarty, Sec. 54, James Vaughan Sur., dry, TD 2,303 ft.

Wilbarger County: P. C. Burns and W. L. Snoddy 1 Bywaters Est., Sec. 8, H&TC, dry, TD 2,004 ft.

John & Pat O'Neil 1-V Waggoner, 15-4-H&TC, dry, TD 2,515 ft.

Young County: W. F. Bockhoff 2 I. G. Roach, Sec. 196, TE&L Sur., dry, TD 1,079 ft.

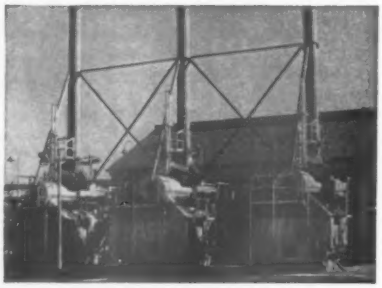
Burk Royalty Co. 3 Gose, TE&L Sur. 728, dry, TD 2,967 ft.

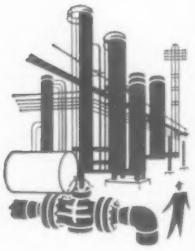
Cox Drilling Co. 1 J. W. Cloud, Henry Hodges Sur., A-134, dry, TD 3,592 ft., elev. 1,215 ft., Caddo 3,572 ft.

H. O. Grace 1 Sam Nash, David Kelly Sur., A-1,476, dry, TD 4,104 ft., elev. 1,263 ft., Caddo 4,044 ft.

WICKES*

*** WICKES steam generators are cutting costs in America's finest refineries and natural gasoline plants**





Recognized Quality Since 1854

143

In scores of refineries and natural gasoline plants, Wickes Type A Steam Generators have helped speed processing and considerably reduce production costs. They operate at a high degree of efficiency and maintenance costs are unusually low. Wickes can fill your requirements for all types of multiple drum boilers up to 250,000 lbs. steam per hour at 1000 psi.—adaptable to any standard method of firing. Units capable of sustained steam production up to 35,000 lbs. per hour at 1000 psi. can be shop-assembled for immediate installation. Write today for descriptive literature or consult your nearest Wickes representative.

THE WICKES BOILER CO.

SAGINAW, MICHIGAN

DIVISION OF THE WICKES CORPORATION

SALES OFFICES: Atlanta • Boston • Buffalo Chicago • Cincinnati • Cleveland • Denver • Detroit Greensboro, N. C. • Houston • Indianapolis • Los Angeles • Memphis • Milwaukee • New York City Pittsburgh • Portland, Ore. • Saginaw • San Francisco • Springfield, Ill. • Tampa, Fla. • Tulsa Washington, D. C.

TEXAS GULF COAST

New Pay at South Segno

Shell Oil Co. has uncovered new oil pay about 2½ miles south of new South Segno field at its 1 Kirby Lumber Corp., Tract 152-A. The 10,201 ft. venture is located on the H&TC Survey 224, A-800, 6½ miles East of the town of Votaw and is completed through casing perforations from 9,808-30 ft. While on a 6/64-in. choke well produced 56.81 bbl. of 31°-gravity oil daily, flowing under a tubing pressure of 2,350 psi., with a resulting gas-oil ratio of 9,000-1.

At Fayette County's Elm Grove area, Hamman Oil & Refining Co. has made new shallow oil discovery at the 1 S. H. McCrorey, lying in the Wm. Kuykendall ½ Lge., A-219, about ¾ of a mile west of the West Muldoon production. Bottomed at 2,030 ft., the discovery is completed from open hole section from 1,886-96 ft. and produced at the rate of 53.8 bbl. of 20°-gravity crude daily while on a 12/64-in. choke. Flow was cut with 50 per cent basic sediment and water, and flowed under a tubing pressure of 360 psi. Well also posted a casing pressure of 520 psi., with a resulting gas-oil ratio of 1,925-1.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Hardin County: Sinclair Oil & Gas Co. 1 Carrie House, Jesse B. Sanders Sur., TD 7,495 ft., PT 2,420,000 cu. ft. of gas per day open flow, gas-oil ratio 9,500-1, 52.6°-gravity oil.

Montgomery County: Superior Oil Co. A-1 D. A. Damuth et al, T. J. Nichols Sur., TD 12,100 ft., PT 20 bbl. of oil per day through regulator, gas-oil ratio 720-1, 35.5°-gravity oil.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Brazoria County: E. Cockrell, Jr. 3 F. A. Brook, S. F. Austin ½ Lge., A-21, TD 4,877 ft., dry.

Calhoun County: The Texas Co. 1 State Tract 10, Lavaca Bay, TD 9,792 ft., dry.

Chamber County: John W. Mecom 4-B W. F. Mayes Est. et al, BBB&C 4, TD 4,899 ft., dry.

DeWitt County: Western Natural Gas Co. 1 M. E. Atkinson, John McCrabb Sur., TD 2,041 ft., dry.

Fayette County: Continental Oil Co. 1 Andrew Thomas et al, Peggy Brown Sur., TD 5,025 ft., dry.

Fort Bend County: Fort Bend Oil Co. 1 Thos. R. Booth, Wiley Martin Sur., TD 8,011 ft., dry.

Hardin County: John W. Mecom 1 J. L.

Hooks Est., J. F. Callahan Sur., TD 10,505 ft., dry.

Shell Oil Co. 1 Kirby Lumber Co., N. H. Howe Sur., TD 7,305 ft., dry.

Jefferson County: Magnolia Petroleum Co. 1-B McFaddin Tr., T&NO Sur. 307, TD 15,529 ft., dry.

Wharton County: Lenoir M. Josey, Inc. 1 E. P. Kramr, Miguel Muldoon Sur., TD 8,530 ft., dry.

SOUTHWEST TEXAS

New Gas-Condensate Strike Reported in San Patricio

Wm. Herbert Hunt Trust estate has opened a new gas-condensate reservoir 2½ miles northeast of Taft in San Patricio County at 2 Emma Herron. Well is shut in awaiting potential test on perforations 8,920-24 ft. On ⅝-in. choke, well flowed ungaged amount of gas and condensate under tubing pressure of 3,000 psi. Operator estimated that the well will produce 15 bbl. of condensate per million cubic feet of gas. Hole is bottomed at 9,300 ft., with 5-in. liner set at total depth.

R. S. Hays and associates of San Antonio are preparing to run potential test on their oil discovery 3 miles north of Alfred in Jim Wells County, 1 Bernard Adams. Wildcat, on preliminary test through P-25 choke, flowed 70 bbl. of 44°-gravity oil per day, no water, under tubing pressure of 800 psi. Casing pressure was 1,025 psi. Discovery is producing from casing perforations 5,367-71 ft. with 24 shots. Total depth is 5,414 ft., with 5½-in. set at bottom. Oil is coming from the basal Vicksburg, topped at 5,363 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Hidalgo County: Sinclair Oil & Gas Co. 1 Schuster unit, Alamo Land & Sugar Co., TD 8,203 ft., PT 70.72 bbl. of oil per day on ¼-in. choke, gas-oil ratio 112-1, 45°-gravity oil.

Jim Wells County: South Texas Oil & Gas Co. 1 Marie Zappe et al, Lavaca Grant, A-166 TD 5,158 ft., PT 11,600,000 cu. ft. of gas per day on open flow, gas-oil ratio 82,400-1, 50°-gravity oil.

San Patricio County: Drilling & Exploration Co. 1 Lula Lee Porterfield, Sargent Sur., A-231, TD 9,580 ft., PT 29,000,000 cu. ft. of gas per day open flow, 60.7°-gravity oil.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Atascosa County: F. B. Cochran 1 Mrs. Rose C. Ermis, La Parita Colony Farms, TD 1,708 ft., dry.

Sid Katz 3 Claudia Krueger, J. Poitevent Sur. 1, A-713, TD 2,100 ft., dry.

Schimmel Drilling Co. 1 A. L. Newman, M. Alcorta Sur., TD 5,140 ft., dry.

Caldwell County: J. W. Haak 1 Virginia Johnson, J. H. Finch Sur., TD 1,887 ft., dry.

Duval County: Don H. Marsh et al 1 Otilla Garcia de Olivares, Santa Cruz de Concepcion Gr., TD 3,632 ft., dry.

C. L. Simpson & Harry B. Williams 1 J. T. Dinn, H. K. Allison Sur., TD 3,520 ft., dry.

Frio County: Texita Oil Co. 1 B. F. Briggs, C. W. Daren Sur., TD 3,212 ft., dry.

Gonzales County: Socs Vratis 1 W. N. Knox, Joaquin del Toro Sur., TD 2,549 ft., dry.

Kenedy County: LaGloria Corp. 1 State Tr. 238, Laguna Madra, TD 7,397 ft., dry.

San Patricio County: Reynolds Metals Co. 1 Joseph F. Green Est., T. T. Williamson Sur., TD 9,193 ft., dry.

Travis County: John C. Robbins 1 E. D. Johnson, S. Bacon Sur., TD 1,000 ft., dry.

KANSAS SUCCESSFUL WILDCATS

Rooks County: Midstates 1 Williams "A," SW SW NW 9-10s-18w, pumped 487 bbl. of oil from Arbuckle 3,736-39 ft., TD 3,739 ft. (new pool).

Sheridan County: National Cooperative 1 Hardesty, SE SE NW 20-6s-26w, pumped 64 bbl. of oil from Lansing-Kansas City 3,823-36 ft., TD 4,189 ft. (opens Hortonville pool).

KANSAS WILDCAT FAILURES

Barber County: Westpan Hydrocarbon 1 Pelton, SW SW SE 27-32s-10w, dry, TD 4,900 ft.

Ellis County: Musgrove 1 Hoffman, SE SE SW 26-12s-17w, dry, TD 3,711 ft.

Ellsworth County: E. K. Carey 1 Long, SE SE SW 28-16s-8w, dry, TD 3,407 ft.

M&L 1 Fuller, SE SE SW 29-17s-7w, dry, TD 3,487 ft.

Osborne County: Anderson-Prichard Oil Corp. 1 Beisner, SW NW NE 5-9s-15w, dry, TD 3,842 ft.

Rooks County: Lindas 1 Maddy, NE NW SW 36-7s-18w, dry, TD 3,402 ft.

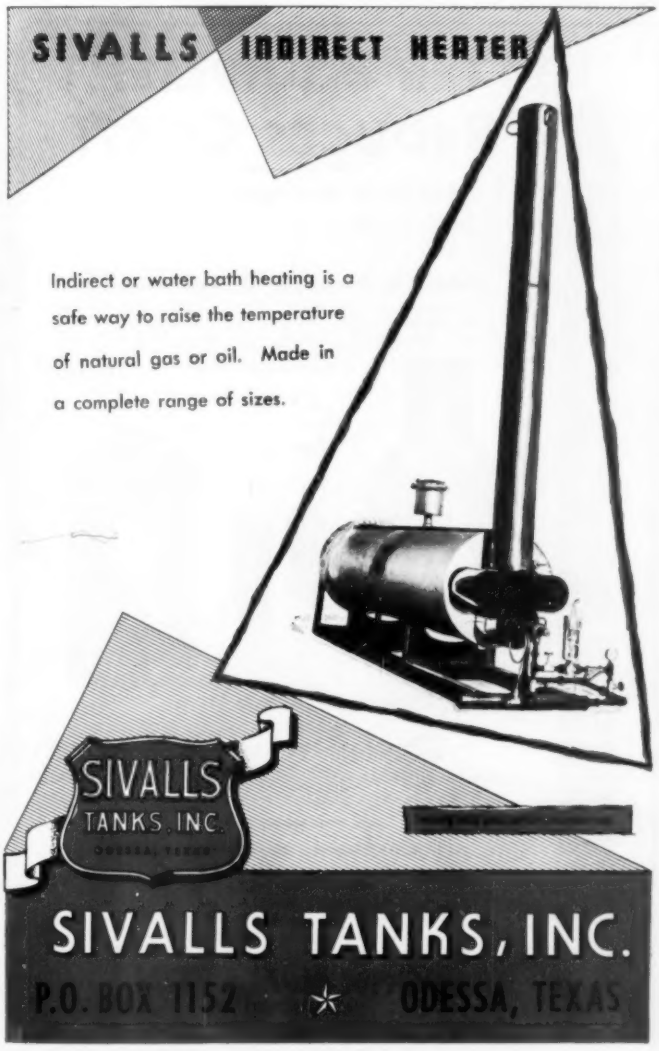
Scott County: Hugoton Production 1 Dirks, NW NE NW 28-16s-33w, dry, TD 5,202 ft.

Sheridan County: J. G. Brown et al 1 Reed, SW SW SW 21-6s-30w, dry, TD 4,608 ft.

Sumner County: Four States 1 Owen, SE SW NE 2-35s-1e, dry, TD 3,869 ft.

EASTERN NEBRASKA SUCCESSFUL WILDCAT

Richardson County: J. C. Higgins 1 Sneathen, pumped 75 bbl. of oil from Viola 3,080-90 ft., TD 3,090 ft.


SIVALLS INDIRECT HEATER
Indirect or water bath heating is a safe way to raise the temperature of natural gas or oil. Made in a complete range of sizes.
SIVALLS TANKS INC.
SIVALLS TANKS, INC.
P.O. BOX 1152
ODESSA, TEXAS

MICHIGAN

Tyrone Confirmed

Tyrone Traverse oil pool, Tyrone Township, Kent County, a 1952 discovered field, appeared to have its first follow-up confirmation well this week as John Neyer tested what appeared to be a good Traverse oil pay at the 1 Groenke et ux, NW SE SE 10-10n-12w. This first well to show pay following the discovery (one well has been drilled dry to the northeast of the discovery) logged Traverse lime at 2,378 ft., about 7 ft. higher structurally than the discovery well. Neyer's well, which is the diagonal southeast 20-acre offset to McGerry, Trustee & McClure Oil Co.'s small discovery producer, was drilled to 2,384 ft., total depth, with pay showing from 2,382 ft. Hole filled about 200 ft. with oil in 2 hours natural and 1,200 ft. in 18 hours. Casing had not been run prior to drill-in. No bottom-hole water appeared but hole was carrying water at the rate of 400 ft. in 24 hours from up-the-hole. After a long string of 5-in. casing was set on a packer at 2,378 ft., and the 200 ft. of water in the hole had been removed, fluid level stood at from 1,800 to 2,000 ft. about the same level that it had maintained before water was bailed out, indicating that oil was filling as fast as the water was removed. Well was scheduled to be tubed and acidized next week. Neyer was surveying location for the diagonal southeast 20-acre offset to the 1 Groenke, the SE SE SE 10-10n-12w, this week.

Tyrone pool appears to be similar in pay characteristics with the closest Traverse pool, Rockfield field, Algoma Township, Kent County, about 11 miles to the southeast.

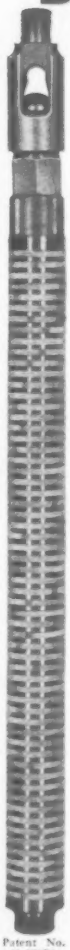
MICHIGAN WILDCAT FAILURES

Allegan County, Saugatuck Township: D. B. K. Van Raalte 1 Reeks, NW NE SW 23-3n-16w, Traverse 1,337 ft., dry, TD 1,531 ft.

Cass County, Newberg Township: Ford Henry 1, Richardson, SE NE SW 31-6s-13w, Traverse 986 ft., dry, TD 1,004 ft.

Muskegon County, Sullivan Township: Max Spidel 1 Sternberg, NW SE NE 26-9n-15w, Traverse 1,907 ft., dry, TD 1,923 ft.

BETTER EQUIPMENT REDUCES COST!



Patent No. Re20574

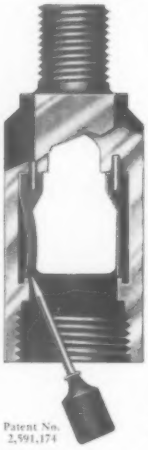
MARTIN PLUNGERS . . . .

. . . thousands in use . . . have brought a new conception of "what pump costs should be" to a great many production men. AND NOW . . .

MARTIN RUBBER GUIDE CAGES

. . . with easily replaced resilient Hycar Rubber Ball Guides . . . add further savings. These guides cannot "beat out" and are very resistant to abrasion. This means very long life PLUS better Ball and Seat life because of protection to the ball.

OPEN TYPE



Patent No. 2,591,174

Top Cage

Synthetic Rubber Ball Guides

Lower Cage

All Martin Cages have Rubber Guides. Made in Open and Closed Types, all sizes and all styles.

Sold thru supply companies

Field Representatives (Manufacturers Agents):

E. W. Brockman, Tulsa, Okla., Phone 7-7477
H. G. Crider, Ardmore, Okla., Phone 2941
J. L. Davis, Houston, Tex., Phone MO-4891
Tom (W. D.) Hulett, El Dorado, Ark., Phone 3-4545
John B. Leland, Denver, Colo., Phone Acoma 6461
Red (L. K.) Martin, Corpus Christi, Tex., Phone 2-5317

JOHN N. MARTIN
MANUFACTURER

9 W. Brady St., Tulsa, Okla. Tel. 4-9415

ILLINOIS

Albion Extension Proved

Production at the southern end of the Albion Consolidated field in the southeastern part of Edwards County, Illinois, has been extended about ¾ mile to the west by a 120-bbl. pumper completed by N. V. Duncan. The well, spotted in the SE NE SE 15-3s-10e, about 4½ miles west of Grayville, produces from Benoist sand, opposite which casing is perforated at 3,012-23 ft. No water was indicated on initial tests. Drilling already is under way at a south offset. Location also is north of the West Grayville area.

ILLINOIS WILDCAT FAILURES

Clinton County: Collins Bros. 1 Billhartz, 21-1n-5w, dry, TD 2,272 ft., Devonian 2,059 ft.

Edgar County: W. B. McDaniel 1 Baber, 25-13n-14w, dry, TD 468 ft.

Jasper County: J. M. Zanetis 1 S. Hull, 21-5n-9e, dry, TD 3,131 ft., elev. 522 ft., McClosky 3,103 ft.

Knox County: L. J. Heller 1 Norman, SE NW SW 27-11n-4e, 4th PM, dry, TD 1,435 ft., Trenton 1,065 ft., St. Peter 1,365 ft.

Shelby County: National Associated 1 E. L. Pfeiffer Commission, 24-11n-5e, dry, TD 2,190 ft., elev. 617 ft., St. Genevieve 2,036 ft.

KENTUCKY

WESTERN KENTUCKY

Henderson County Gets New Tar Springs Field

A new Tar Springs producing area, located 2 miles southeast of Smith Mills and 3 miles northwest of Corydon, in western Henderson County, near the Union County line, is being opened by Howard Atha and associates at their 1 Williams, spotted in the NW NW NW 16-P-22. On swab tests with pay in open hole at 1,863-75 ft., the well produced at an average rate of 3 bbl. of oil per hour. The discovery is approximately a mile north of the Midway pool, nearest other production.

WESTERN KENTUCKY WILDCAT FAILURES

Hopkins County: Sun Oil Co. 1 Rudd, SW SE NE SE 8-K-25, dry, TD 3,018 ft.

Webster County: Eureka Operating, Inc., 1 Black, SW SE NE SW, dry, TD 2,055 ft.

Eureka Operating, Inc., 1-A Black, SW SE NE SW 14-L-20, dry, TD 301 ft.

National Associated Petroleum Co. 1 Lisman, NW SE SE SE 10-M-22, dry, TD 3,229 ft.

EASTERN KENTUCKY

In the Pilot pool area of western Wolfe County and located on the waters of Middle Fork, Charles Ledford et al has completed 7 Ledford, White and Tidwell as a 10-bbl. oil well from the Corniferous lime topped at

830 ft. and bottomed at 954 ft. Test was drilled on an old Bledsoe and Martindale lease.

INDIANA

New Dubois County Pool Produces from Two Pays

A new producing area with two pay zones, both at relatively shallow depths, has been opened 2½ miles southwest of Huntingburg, in southwestern Dubois County, Indiana.

The discovery, made by L. F. Burkart at his 1 Hannebutt, NW NW SW 9-3s-5w, completed as a 50-bbl. pumper from Aux Vases lime at 838-57 ft., already has been confirmed by two additional producers from the same pay. One of these, Mulzer Brothers 1 Schmett, completed flowing 120 bbl. per day, extended the pay more than a mile to the southwest with location in the SE SW NNW 17-3s-5w. Its pay interval is at 968-72 ft. The other, Burkhart's 2 Hannebutt, is ¼ mile northeast of the discovery.

In the meantime, two additional wells have found production in Jackson sand, the second pay zone for the area. One is Burkhart's 3 Hannebutt, a location east of 2 Hannebutt, with pay at 775-77 ft. The other, Mulzer Brothers 2 Schmett, is ¼ mile southwest of 1 Schmett, the latter operators' Aux Vases extension producer.

INDIANA WILDCAT FAILURES

Perry County: R. Jarboe 1 Hauser, NE NE SW 3-6s-3w, dry, TD 965 ft.

Spencer County: Wise & Caldemeyer 1 Gogel, SE SE SE 24-4s-5w, dry, TD 1,054 ft.

Sullivan County: R. Portis 1 Templeton, SE NW NW 30-8n-8w, dry, TD 1,356 ft.

APPALACHIAN AREA

OHIO

The eastern branch of New Castle pool was extended a location to the north by the Preston Oil 1 H. D. Scott, third quarter, New Castle Township, Coshocton County. Clinton sand at 3,312-62 ft. was shot and made 55 bbl. in the first 24 hours. In Pike Township, Coshocton County, Mid East Oil Co. 2 Perry Ashcraft, a ½-mile extension to the field, found the Clinton at 3,168-3,206 ft. with 400,000 cu. ft. natural, and 800,000 cu. ft. when shut in after shot.

J. W. Bebout et al. 2 Christian Heckel, Section 22, Newton Township, Muskingum County, topped the Clinton at 3,458 ft. and drilled in to 3,487 ft., where the open flow was 550,000 cu. ft. natural.

Frank Lyons et al. are drilling in the Big lime in a wildcat on Max Carrothers in Section 14, Monroe Township, Muskingum County.

OHIO SUCCESSFUL WILDCAT

Coshocton County, Perry Township: Morrow Oil & Gas Co. 1 Conard, Sec. 13, Clinton 3,268-3,319 ft., 19 bbl. of oil, TD 3,340 ft.

OHIO WILDCAT FAILURES

Huron County, Ripley Township: Delton & McManaway 1 Lamereau, Lot 4, Trenton 3,212-3,413 ft., dry, TD 3,413 ft.

Jefferson County, Ross Township: Surety Rubber Co. 1 Theo. Raab, Sec. 32, Clinton 6,705-63 ft., dry, TD 6,860 ft.

ROCKY MOUNTAIN

Montana Wildcat Adds New Williston Interest

Shows of live oil in an eastern Montana wildcat have added new interest to the Williston basin area east of established Montana production and in the general central area of the basin.

Sun Oil Co. and Phillips Petroleum Corp. recovered 5 ft. of clean oil and 900 ft. of water cushion slightly oil cut on drill-stem test at the 1 Dynneson, C SW NE 32-24n-58e, northwest of Sidney, Richland County. Test was of the zone 10,455-504 ft., and included 15 ft. of oil and gas-cut mud in addition to the oil-cut cushion and the 5 ft. of free oil. Formation has not definitely been identified, but is presumed to be Upper Devonian. While the recovery is not sufficient to offer particular encouragement for the zone, the presence of oil without formation water in this deeper horizon is regarded as encouraging. The well will test to Ordovician at about 13,000 ft. and shows in the current test as well as those encountered up-hole in Madison cannot be evaluated short of acidization. The operator is drilling ahead below 10,542 ft.

Southwest of Richey field and between it and the Southwest Richey area proper, Whell Oil Co. has completed a discovery in the Duck Creek area of McCone County. The well is 22-24-B-NP, E½ SE NW 25-22n-48e, and a pump gage of 110 bbl. of fluid, 51 of which were oil, was reported. This well was suspended some months ago after preliminary tests, and reworking operations began after the Southwest Richey-Devonian-Silurian discovery 3 miles southwest of Duck Creek

For results in coring

call on D&S

"KNOW-HOW"

PLUS Truco DIAMOND BITS

AND D&S CORE BARRELS

Drilling & Service

3031 Elm Street Dallas 1, Texas

OFFICE PHONE: Riverside 6811

NIGHT NUMBERS: ELmhurst 6335, Victor 3708

Other Offices-Services: Tyler, Texas — 2-2742; Odessa, Texas — 6-6774; Abilene, Texas — 2-2790; Victoria, Texas — 3264; Norman, Okla. — 4360; Shreveport, La. — 5-5474; Casper, Wyo. — 2-3761; Carmi, Ill. — 7799; Ft. Morgan, Colo. — 1143; Great Bend, Kans. — 7995

Distributor: Allied Services, Inc., Mt. Pleasant, Michigan Telephone: 29-861

Foreign: D. T. O'Connor, 500 Fifth Avenue, New York, N. Y. Petroleum Industry Consultants, C. A., Caracas, Venez. Denton-Spencer Co., Ltd., Calgary, Alberta, Canada

THE OIL AND GAS JOURNAL

"Miss Swanson, let's see if we can't get rid of that old tank sitting out there."

When You Need Efficiency in Swabbing

You Can Depend on Bell Swabs

Whether swabbing

. . . oil

. . . water

. . . or mud . . .

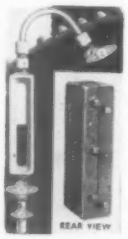
you can depend on BELL'S DESIGN and QUALITY for

MAXIMUM RECOVERY

BELL RUBBER COMPANY
- Phone EDgemont 2-1281
- 6001 W. Jefferson
- P. O. Box 4426
- DALLAS 11, TEXAS

EXTRA HEAVY GLASS

INFERNO "Clamp Type" Reflex Gauge



The INFERNO "Clamp Type" Gauge has wider, heavier (1" thick) glass than is used with the ordinary reflex gauge. When water conditions are bad this is a distinct advantage, because the heavier glass lasts much longer. Write for a copy of Bulletin 19B.

THE INFERNO CO.
Box 1138A
115 RICOU St.
SHREVEPORT, LA.
INFERNO

was completed. Production at Duck Creek is producing through perforations in lower Jefferson, topped at 8,662 ft.

MONTANA SUCCESSFUL WILDCAT

McCone County: Shell Oil Co. NP 22-25-"B," E½ SE NW 25-22n-48e, pumped 51 bbl. of oil from lower Jefferson 8,662 ft., TD 10,188 ft., PBTD 9,850 ft.

NORTH DAKOTA

Keene Area Test Flows Oil

On the North Dakota side of the Williston basin, Amerada Petroleum Corp. and Pacific Western Oil Co. reported a flow of 106 bbl. of oil per day from Madison at 1 Wollan, C NW NW 15-15n-96w, in the Keene area of McKenzie County. The well is 6 miles southeast of Amerada's discovery in the Croff area of the same county. The well produced from the interval 9,056-9,115 ft. and gage followed acidization of the interval. Thirty bbl. of water per day was produced with the oil.

On the east side of the basin activity in the Turtle Mountain area of Bottineau County was slowed, with all but two wells in the area shut down. Weather, drilling-in equipment, and repairs were among delaying factors. One well, Holbert Drilling Co.'s 1 Ekrahagen, C NE SE 9-163n-78w, was continuing production tests with last pump recently reported including 3 bbl. of oil in 8 hours with an undetermined amount of water.

NORTH DAKOTA WILDCAT FAILURE

Bottineau County: Lion Oil Co. 1 Huss, C NW NW 23-163n-75w, dry, TD 6,437 ft., pre-Cambrian 6,435 ft.

SOUTH DAKOTA

Dewey Test Slated

Youngblood & Youngblood of Oklahoma City and Dallas have announced location for a wildcat, 1 Galvin, C SE SE 25-16n-22e, in Dewey County, South Dakota. The well is reportedly located on lands farmed out from Shell, and is southeast of a series through Perkins and Corson counties which Shell completed a year ago. There have been no previous deep tests in the area of the current location.

Only other wildcat in South Dakota drawing current attention is Carter Oil Co.'s 1 Hendricks, C SW NW 2-20n-3e, Harding County, which is at 6,354 ft., preparing to test with top of Amsden reported at 6,180 ft.

WYOMING

Weather Slows Crook Test

In Wyoming adverse weather conditions slowed testing operations at the apparent discovery in Crook County, on the east side of the Powder River basin. True Brown, Fulton, Cower & Winegar of Casper and Denver reported swab recovery of 100 bbl. of 38.2° gravity oil from perforations 6,236-52 ft. in Dakota over 15½-hour period. Tests are continuing. The well, 1 Stephenson, C NE SW, 5-49n-68w, is the first to indicate success in Crook County, and is north of production through Weston County.

In the Big Horn basin the Pegasus division of Socony-Vacuum Oil Co. reported an estimated flow of 800 to 1,000 bbl. of oil with about two million cubic feet of gas per day from 32-19-G, C SW NE 19-50n-92w, ¾ mile east of the discovery at Manderson, Big Horn County. The well was acidized in the Phosphoria interval 7,750-96 ft. with 20,000 gal. prior to test. Operator reported this step-out 570 ft. lower at ttop of Phosphoria than the discovery well.

WYOMING WILDCAT FAILURES

Fremont County: Wind River Oil Co., P. R. Rutherford and Slick Moorman 3 Government, SE SW SE 10-33n-99w, dry, TD 3,629 ft. Tensleep 3,567 ft.

Johnson County: H. L. Hawkins 1 Government-Hawkins, C NE SE 23-41n-78w, dry, TD 7,548 ft. Lakota 7,488 ft.

Laramie County: Progress Petroleum Corp. of Texas 1 Hereford Ranch, C NE SE 11-13n-65w, dry, TD 9,568 ft. Sundance(?) 9,487 ft.

Washakie County: Gulf Oil Corp. 1 State-Howell, NW SE NE 36-48n-90w, dry, TD 2,365 ft. Curtis sand 1,120 ft.

DENVER-JULESBURG BASIN

Roggen Discovery Finaled

Completions were of interest in the Denver-Julesburg basin of Colorado and western Nebraska.

Twin Oil Corp. reported completion of 2 Cuykendall, NW NW SW 12-2n-63w, in the Roggen area of Weld County, Colorado, for a pump gage of 288 bbl. of oil per day. Production is from "J" sand topped at 7,021 ft. The discovery is the most centrally located from a geologic point of view of production in this basin. No plans for confirmation test have been announced.

Logan County, Colorado, had an indicated gas discovery 12 miles west of Armstrong pool. Roden, Darden & McRae and Balderson Drilling Co. reported recovery of gas at the rate of six to eight million cubic feet per day from "D" sand at 1 Haywood, SW SE SE 6-11n-54w.

In the same county, H. C. Arnold has completed 1 State NE NE SW 16-8n-50w, north of the Frenchman's Creek area for a gage of 4,500,000 cu. ft. gas per day from the "J" sand. Gage was on ½-in. choke.

In Nebraska Forest Oil Corp. has completed 1 Marcum, NW NW NW 27-13n-55w, Kimball County, for a pump gage of 27 bbl. of oil, cut 3-4 per cent water following Sandfrac of the "J" sand.

In Scottsbluff County, northeast of the town of Scottsbluff, Colling Oil Co. has abandoned the 1 Baxter, C SE NW 14-22n-54w, after recovery of 4 bbl. of oil and 60 of water on 11-hour swab test. Show was in the "J" sand. The county has no production.

COLORADO WILDCAT FAILURES

Logan County: Hodge & Sheppard 1 Iliff, NW NW SE 28-7n-48w, dry, TD 4,142 ft. "J" sand 4,068 ft.

W. M. & A. P. Fuller 1 Tomkins, NE NE NW 33-8n-54w, dry, TD 5,540 ft.

Rex Monshan and Sterling Drilling Co. 1 Gotfredson, SW SW NE 35-12n-53w, dry, TD 5,477 ft. Skull Creek 5,444 ft.

(Continued on page 263)

WELL LOGGING
Experienced Geologists
in
On-Location Laboratory Units
U.S.A. — Foreign
Currently Operating Throughout the World
Call or Wire Collect for Nearest Representative
GEOLOGICAL WELL SERVICE COMPANY
(Geo-Service Company)
White Building
Abilene, Texas, U.S.A.
Telephone 28996, 29934, 26185, 28355
Brochure and References on Request

Completions Highest Since July

by John C. McCaslin

TOTAL completions for the first month of the new year were up 12 per cent over December, but fell about 2 per cent from January 1952 levels. However, completions in the United States were at the highest level since July 1952. Total footage drilled during January was up considerably over December, but fell short of the previous year's period. Oil-well completions were up 15 per cent over the previous month, but fell short of January 1952's totals. Gas-well completions remained the same during the month, while a 9 per cent gain in dry holes completed was noted over the previous month's figures.

Completions in Oklahoma were at record-high levels, while Texas totals showed the highest increase since last October. An increase in total completions was noted in the southeastern states, the Rocky Mountain states and New Mexico, North Dakota, and Nebraska, while a slight decline was noted in the Illinois basin areas.

More new locations were announced in Wyoming fields than in any previous midwinter period in the history of the industry in the Rocky Mountain area as an increase in development drilling started as a result of the new Platte Pipe Line's outlet facilities. The Little Buffalo basin and Sage Creek were especially active.

Cuyama Valley, California, with six wildcats under way and a seventh preparing to start, was enjoying the most activity it has seen in the past year. In South Cuyama field, development of Hibbard zone production also again was under way after a year's lull. At Wheeler Ridge in southeastern San Joaquin Valley, Richfield Oil Corp. completed its fourth producer in the 9,500-ft. Eocene pool. As did the other three, the 14-28 Gordon flowed at rates in excess of 1,000 bbl. daily.

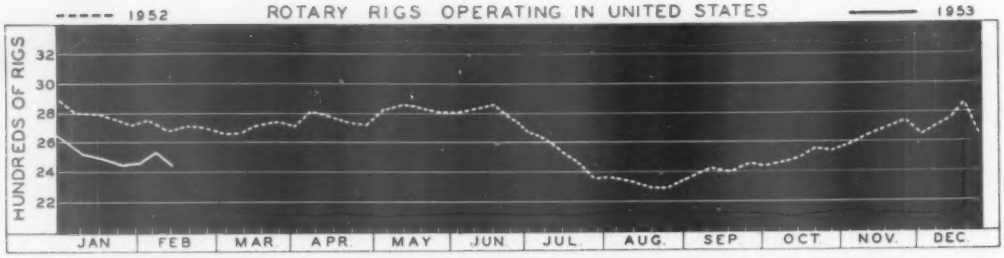
Oklahoma's most active area from the development standpoint is East Payson field in southern Lincoln County. The field, opened in 1952 by Gulf Oil Corp., now has 30 producing wells. There have been no dry holes drilled in the field since its discovery. There are currently about eight rigs running in the area. East Payson field produces from the lower Skinner sand.

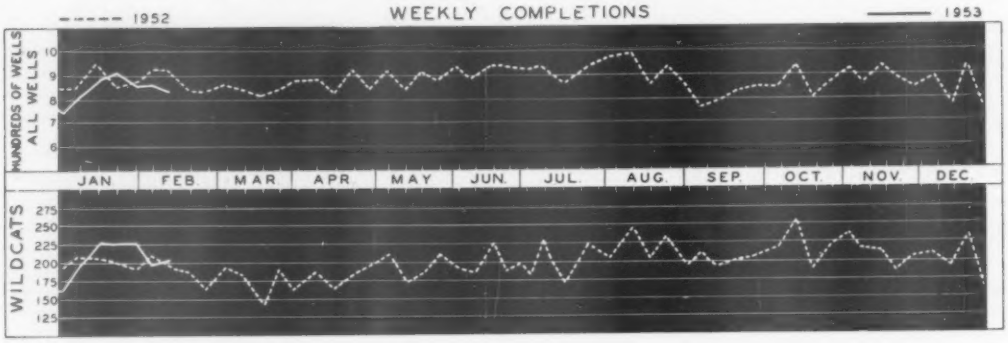
The Texas Panhandle's new Quinduno field in Roberts County received a new 2-mile southeast extension, bringing the over-all northwest-southeast length of the field to nearly 5 miles. This new field, which is on a trend 80 miles northwest of western Oklahoma's Elk City field, has been the most active development area in the Panhandle since its discovery last year.

SUMMARY OF COMPLETIONS, JANUARY 1953

	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	44	22	0	22	44	0	0	0	0	0	62,800	55
Pennsylvania	116	50	14	52	92	10	13	1	0	0	163,208	140
West Virginia	33	5	17	11	18	11	4	0	0	0	94,537	201
Maryland	0	0	0	0	0	0	0	0	0	0	0	5
Ohio	85	44	8	33	40	45	0	0	0	0	196,871	162
Kentucky	87	26	14	47	70	17	0	0	0	0	184,206	69
Illinois	169	75	1	93	57	111	1	0	0	0	430,423	284
Indiana	142	51	11	80	118	24	0	0	0	0	252,634	100
Michigan	61	22	4	35	33	25	3	0	0	0	157,517	102
Kansas	399	154	30	215	37	353	9	0	0	0	1,369,195	476
Nebraska	31	9	1	21	1	10	20	0	0	0	162,236	27
Oklahoma	614	339	30	245	164	339	83	23	4	1	2,210,575	990
Texas	1,314	710	50	554	259	481	371	155	39	9	6,294,118	1,126
N. Central (Dist. 7-B & 9)	466	216	8	242	157	214	93	2	0	0	1,596,420	301
West (Dist. 7-C & 8)	338	237	0	101	31	96	129	57	19	6	1,947,764	286
Panhandle (Dist. 10)	59	36	15	8	5	51	1	2	0	0	202,887	83
Eastern (Dist. 5 & 6)	60	21	3	36	8	22	25	4	0	1	295,485	49
Gulf Coast (Dist. 2 & 3)	186	89	12	85	13	42	60	56	13	2	1,212,106	197
Southwest (Dist. 1 & 4)	205	111	12	82	45	56	63	34	7	0	1,039,456	210
Louisiana	242	141	16	85	73	37	36	48	38	10	1,455,276	289
North	136	76	10	50	66	29	23	13	5	0	516,856	90
South	106	65	6	35	7	8	13	35	33	10	938,420	199
Arkansas	49	21	0	28	9	34	2	3	1	0	174,846	27
Mississippi	36	12	0	24	0	2	22	8	4	0	269,783	30
Ala.-Ga.-Fla.	11	3	0	8	0	3	7	1	0	0	61,203	10
Montana	45	25	3	17	13	18	6	7	1	0	189,257	60
Wyoming	57	26	2	29	14	23	16	3	1	0	248,230	111
Colorado	51	11	3	37	0	21	29	1	0	0	268,237	66
Utah	7	1	1	5	1	2	2	2	0	0	39,684	37
New Mexico	139	46	67	26	28	38	37	19	12	5	765,102	250
California	208	149	2	57	66	73	44	12	13	0	887,132	273
North Dakota	22	15	0	7	0	3	4	15	0	0	160,594	34
Miscellaneous	§7	0	1	6	6	1	0	0	0	0	9,950	¶21
Total January 1953	3,969	†1,957	275	*1,737	1,143	1,681	709	298	113	25	16,107,614	‡4,945
Total December 1952	3,554	1,690	275	1,589	1,088	1,521	579	228	106	32	14,499,719	5,066
Western Canada	153	95	6	52	25	71	51	4	2	0	640,993	.....
Alberta	101	61	3	37	12	40	46	2	1	0	455,033	.....
Saskatchewan	45	34	0	11	13	30	2	0	0	0	135,449	.....
British Columbia	6	0	3	3	0	0	3	2	1	0	46,698	.....
Manitoba	1	0	0	1	0	1	0	0	0	0	3,813	.....

*Incl. 81 service wells: N. Y. 22, Pa. 41, Ind. 2, Ohio 8, Kans. 2, Okla. 5, W. Tex. 1. †Incl. 38 condensate wells: Okla. 3, E. Tex. 1, Tex. Gulf Coast 8, S.W. Tex. 15, S. La. 11. ‡Incl. all wells rigged up and/or drilling at months end. §Incl. 6 Tenn., 1 gas, 5 dry wildcats, 5,446 ft., S. D. 1 dry wildcat, 4,504 ft. ¶Incl. Tenn. 10, S. D. 2, Idaho-Ariz.-Nev. 9.





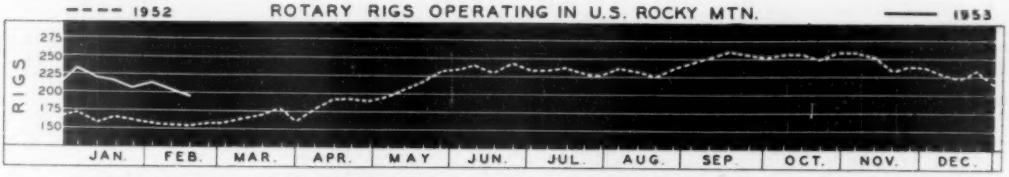
CURRENT STATISTICS

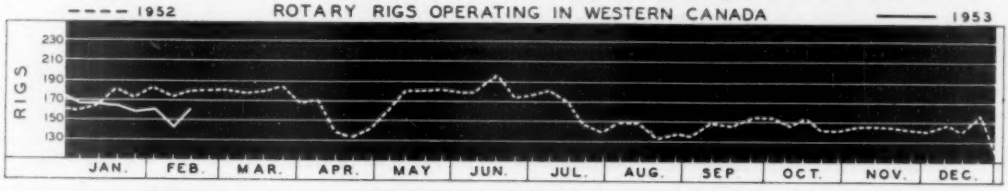
EXPLORATION

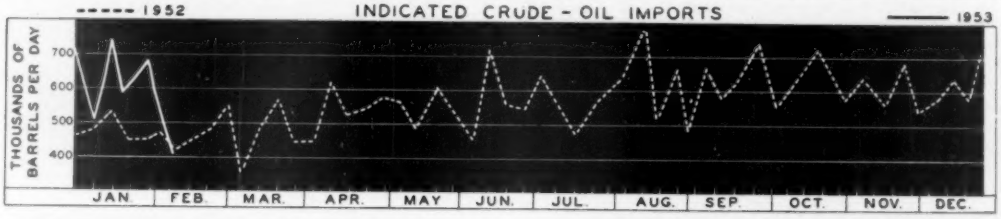
WEEKLY WELL COMPLETIONS . . .WEEK ENDED FEBRUARY 14, 1953

	Total of all wells					Feb. 14		Wildcat completions and discoveries					Cumulative total, 1953				
	Comp.	Oil	Gas	Dry	Footage	1953	1952	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	11	5	0	*6	15,700	82	69	0	0	0	0	0	0	0	0	0	0
Pennsylvania	29	13	3	†13	40,802	205	192	0	0	0	0	0	0	0	2	5	7
West Virginia	10	1	9	0	30,933	63	76	0	0	0	0	0	0	0	0	0	0
Ohio	20	6	7	‡7	44,609	116	117	1	0	0	2	3	1	0	0	3	4
Indiana	11	4	0	7	22,222	168	144	0	0	0	3	3	5	0	1	31	37
Kentucky	20	5	7	8	36,580	137	157	0	0	0	4	4	4	0	1	23	28
Illinois	29	12	0	17	73,723	242	212	0	0	0	5	5	1	0	0	44	45
Michigan	5	1	1	3	8,144	75	65	0	0	0	3	3	4	0	1	29	34
Kansas	82	45	5	§32	268,119	536	629	2	0	0	9	11	15	0	3	95	113
Nebraska	6	2	0	4	30,519	37	39	2	0	0	4	6	2	0	0	18	20
Oklahoma	117	74	5	‡38	429,019	774	802	4	0	1	11	16	11	2	4	81	98
Texas	315	173	20	122	1,399,342	1,912	2,378	19	3	3	84	109	109	15	21	508	653
N. Central (Dist. 7-B & 9)	133	63	4	66	459,394	659	744	12	0	1	38	51	58	0	4	207	269
West (Dist. 7-C & 8)	64	50	0	14	302,795	443	755	1	0	0	10	11	15	1	0	83	99
Panhandle (Dist. 10)	13	7	6	0	39,984	94	85	0	0	0	0	0	0	2	0	6	8
Eastern (Dist. 5 & 6)	12	5	4	3	63,632	83	101	1	0	0	2	3	2	0	0	29	31
Gulf Coast (Dist. 2 & 3)	44	28	2	14	294,365	294	376	3	1	0	13	17	20	2	6	81	109
Southwest (Dist. 1 & 4)	49	20	4	25	239,172	339	317	2	2	2	21	27	14	10	11	102	137
Louisiana	57	30	5	22	454,447	336	304	1	0	1	9	11	9	1	4	45	59
Northern	18	12	1	5	67,140	149	161	0	0	0	3	3	1	0	0	21	22
Southern	39	18	4	17	387,307	187	143	1	0	1	6	8	8	1	4	24	37
Arkansas	5	3	0	2	22,975	54	52	0	0	0	0	0	2	0	0	11	13
Mississippi	12	2	0	10	90,455	56	62	1	0	0	8	9	5	0	0	27	32
Southeastern States	3	1	0	2	13,626	18	7	0	0	0	2	2	1	0	0	14	15
Montana	8	5	0	3	54,018	47	15	1	0	0	1	2	1	0	0	9	10
Wyoming	12	5	0	7	54,903	68	68	0	0	0	4	4	1	0	0	17	18
Colorado	11	6	0	5	59,548	70	59	1	0	0	4	5	2	0	1	42	45
Utah	0	0	0	0	0	7	4	0	0	0	0	0	1	0	0	4	5
New Mexico	21	8	7	6	117,513	150	106	0	0	0	3	3	3	0	1	18	22
California	43	34	0	9	198,400	297	294	0	0	0	7	7	3	0	1	70	74
North Dakota	5	3	0	2	40,170	31	1	0	0	0	1	1	0	0	0	10	10
Miscellaneous	0	0	0	0	0	7	11	0	0	0	0	0	0	0	0	5	5
Total United States	832	438	69	325	3,505,767	5,488	5,863	32	3	5	164	204	180	18	40	1,109	1,347
Total previous week	861	443	65	353	3,644,101			26	2	7	161	196	148	15	35	945	1,143
Total February 16, 1952	831	444	58	329	3,626,510			31	0	4	151	186	176	13	30	1,109	1,328

Service wells included: *6, †11, ‡3, §1.



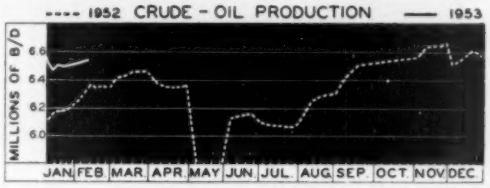


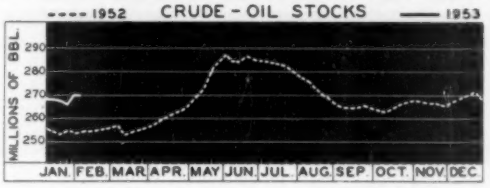


DAILY AVERAGE PRODUCTION FOR WEEK

	February 14			Feb. 7
	Crude oil	Lease condensate	Total	total
Alabama	4,200		4,200	4,100
Arkansas	77,200	650	77,850	78,000
California	989,700		989,700	993,400
Colorado	85,100		85,100	85,600
Eastern	54,500		54,500	54,500
Florida	1,550		1,550	1,550
Illinois	165,100		165,100	165,900
Indiana	34,100		34,100	34,400
Kansas	353,900		353,900	334,300
Kentucky	30,000		30,000	30,200
Louisiana	658,650	38,500	697,150	696,850
North	110,000	2,500	112,500	112,200
South	548,650	36,000	584,650	584,650
Michigan	35,200		35,200	35,300
Mississippi	91,600	4,500	96,100	96,600
Montana	31,000		31,000	28,200
Nebraska	12,800		12,800	12,900
New Mexico	178,725	625	179,350	179,450
Oklahoma	533,200		533,200	529,800
Texas	2,889,525	50,425	2,939,950	2,939,950
Dist. 1	36,500	250	36,750	36,750
Dist. 2	161,475	6,000	167,475	167,475
Dist. 3	471,750	25,700	497,450	497,450
Dist. 4	261,100	6,000	267,100	267,100
Dist. 5	51,850	400	52,250	52,250
Dist. 6	125,900	6,000	131,900	131,900
East Texas field	259,900		259,900	259,900
Dist. 7-B	111,400	100	111,500	111,500
Dist. 7-C	174,050	5,100	179,150	179,150
Dist. 8	971,800	350	972,150	972,150
Dist. 9	187,800	500	188,300	188,300
Dist. 10	76,000	25	76,025	76,025
Utah	5,400		5,400	5,300
Wyoming	216,900		216,900	217,400
North Dakota	10,600		10,600	11,200
Total U. S.	6,458,950	94,700	6,553,650	6,534,900
Change from previous week, up			18,750	
Canada	172,500		172,500	122,225
Total U. S. Production January 1-February 14			293,139,425 bbl.	
Same period last year (crude plus cond.)			*281,864,280 bbl.	

*Includes 4,288,865 bbl. condensate.



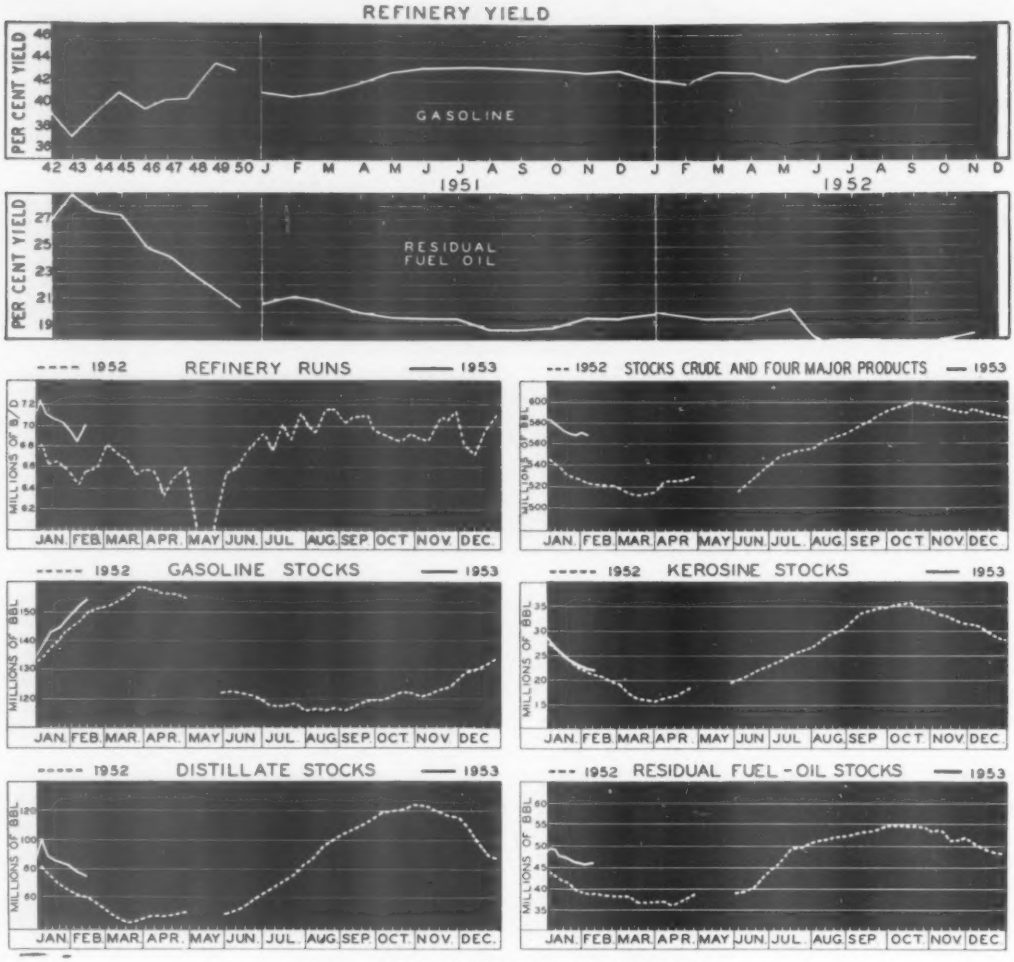


CRUDE-OIL STOCKS BY STATES OF ORIGIN*

(Thousands of barrels)

	Feb. 7, '53	Jan. 31, '53	Feb. 9, '52
Pennsylvania Grade	2,101	2,147	2,087
Other Appalachian	2,030	1,940	1,982
Illinois, Indiana, Michigan	10,438	9,829	11,427
Arkansas	3,049	3,176	2,951
Louisiana	16,106	15,364	13,659
North	2,354	2,515	2,724
Gulf	13,752	12,849	10,935
Mississippi	3,334	3,249	3,601
New Mexico	7,262	7,083	7,442
Oklahoma and Kansas	37,206	36,985	39,709
Texas	132,673	134,235	121,051
East Texas proper	10,941	11,169	11,026
West Texas	63,581	63,790	54,940
Texas Gulf	25,369	25,614	25,325
Other Texas	32,782	33,662	29,760
Rocky Mountain	15,348	15,127	13,881
California	33,325	33,108	30,945
Foreign	7,310	8,398	6,129
Total	270,182	270,641	254,864

*Bureau of Mines

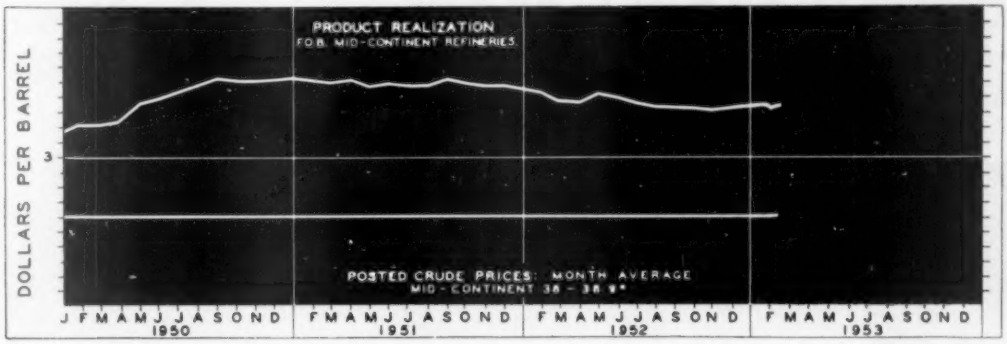

REFINERY YIELD
PER CENT YIELD
GASOLINE
42 43 44 45 46 47 48 49 50 J F M A M J J A S O N D J F M A M J J A S O N D
1951
1952
PER CENT YIELD
RESIDUAL FUEL OIL
---- 1952 REFINERY RUNS —— 1953
MILLIONS OF B/D
JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP OCT. NOV. DEC.
--- 1952 STOCKS CRUDE AND FOUR MAJOR PRODUCTS — 1953
MILLIONS OF BBL
JAN. FEB. MAR APR MAY JUN JUL AUG. SEP OCT NOV DEC
----- 1952 GASOLINE STOCKS —— 1953
MILLIONS OF BBL
JAN. FEB. MAR. APR. MAY JUN JUL AUG. SEP OCT. NOV DEC
----- 1952 KEROSINE STOCKS —— 1953
MILLIONS OF BBL
JAN. FEB. MAR APR MAY JUN JUL AUG. SEP OCT. NOV DEC.
----- 1952 DISTILLATE STOCKS —— 1953
MILLIONS OF BBL
JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.
--- 1952 RESIDUAL FUEL - OIL STOCKS — 1953
MILLIONS OF BBL
JAN. FEB. MAR APR. MAY JUN JUL AUG SEP OCT NOV DEC

A.P.I. REFINERY REPORT, FEBRUARY 14

(Thousands of Barrels)

District—	Daily avg. runs	Daily average production—Gaso.*	Kero.	Dist.	Resid.	Stocks‡—Gaso.†	Kero.	Dist.	Resid.	Bureau of Mines, February 1952—Daily avg. runs	Daily average production—Gaso.*	Kero.	Dist.	Resid.
East Coast	994	426.2	40.4	245.9	232.4	34,409	9,775	27,345	12,286	973	383.9	41.5	252.4	245.5
Appalachian:														
District 1	114	46.4	7.9	20.3	17.0	4,437	506	1,303	608	109	45.1	4.7	19.3	15.0
District 2	98	49.9	9.3	18.0	19.9	1,847	304	475	180	82	39.1	5.1	14.0	20.2
Ind., Ill., Ky.	1,298	703.0	93.6	253.4	187.3	35,350	4,944	12,145	4,520	1,252	664.9	84.4	232.8	196.9
Okla., Kans., Mo.	583	344.0	14.7	128.7	58.1	17,101	1,224	8,288	1,162	556	310.6	13.6	134.5	68.4
Inland Texas	266	179.4	13.3	43.1	35.9	6,114	334	1,298	930	251	176.1	15.2	40.2	41.2
Texas Gulf Coast	1,763	788.9	149.4	404.6	251.4	20,859	2,278	7,630	6,623	1,645	740.0	137.9	421.3	255.8
La. Gulf Coast	533	240.0	40.0	149.0	46.9	8,342	1,272	3,629	1,312	530	214.6	49.0	154.8	60.3
N. La. and Ark.	86	35.1	8.0	24.3	8.4	3,397	485	1,053	103	79	35.5	7.2	20.4	6.8
Rocky Mountain:														
New Mexico	18	11.1		2.9	3.7	166		46	32	17	10.6	0.5	2.5	3.9
Other Rocky Mtn.	232	113.0	3.7	49.4	44.7	6,152	311	1,590	919	217	99.2	6.9	48.8	47.7
California	1,032	427.6	6.6	172.1	347.6	16,295	382	10,176	17,279	962	389.5	4.4	187.1	360.8
Feb. 14, 1953	7,017	3,364.6	386.9	1,511.7	1,253.3	154,469	21,815	74,978	45,954	6,673	3,109.1	370.4	1,528.1	1,322.5
Feb. 7, 1953	6,834	3,318.9	383.4	1,454.0	1,258.3	152,493	22,308	78,152	45,807	.....	.....	.....	.....	.....
Feb. 16, 1952	6,591	3,102.1	342.9	1,499.7	1,311.1	150,087	20,506	62,191	38,602	.....	.....	.....	.....	.....

*At refineries including natural blended. †Finished and unfinished. ‡At refineries, bulk terminals, in transit, and in pipe lines.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
3
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1950
J F M A M J J A S O N D
1951
J F M A M J J A S O N D
1952
J F M A M J J A S O N D
1953

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate and fuel oil. Realization averaged $3.35 for week ended February 7, $3.34 for previous week, and $3.42 for February 1952. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of February 18, 1953. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅛-10½	12.125-12.75	10¾-11
Premium gasoline, 86-88 octane	11¼-11½	13.25-14.0	11¾-12
42-44 w.w. kerosine	8½-9	10.50-10.65	9
No. 2 straw fuel oil	7½-8	9.50-9.65	8
No. 6 residual	$0.85-1.00	$1.90-2.15	$1.50-1.65

NATURAL GASOLINE

	Group 3	North Tex.	N. La.
Grade 26-70	5⅞	5⅜	5⅝
Grade 18-55	7.05	6.55	6.80

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	12-13
750 vis., No. 3-4 neutral	15-16
2,000 No. 5-6 neutral	17-19

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	21-22
200 vis., No. 3 neutral, 0-10 pp.	12-13

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	27.5
180 vis., 0 p.t. neutral	29.5

WAX
Mid-Continent

132-134 A.M.P.	5.5

THE Standard Oil Co. of California announced a crude and product price increase, effective February 16. The increases in crude prices varied from 10 to 50 cents a barrel with the larger increase going to light crudes. Wholesale prices of motor and aviation gasoline increased 1.6 cents a gallon, and distillates moved up 1.8 cents. Heavy fuel was advanced 10 cents a barrel.

Pennsylvania Grade crude prices were increased 15 cents a barrel, also effective February 16.

The second decrease of the year for natural gasoline came on February 16, a cut of 0.5 cent a gallon to bring the Group 3 price for Grade 26-70 down to 5.875 cents. The reductions this year have come earlier than they did in 1952. The first cut this year came about 10 days before the end of January compared with last year's continuation of prices at ceiling levels until the last week in February. Total reduction in the early months of 1952 amounted to 1.375 cents a gallon. The two cuts so far this year have been for 0.5 cent each.

The end of the towboat strike in New York Harbor has resulted in the return of pressure on fuel prices, both light and heavy. Primary distillate stocks on th East Coast on February 7 were about 9,000,000 bbl. greater than on corresponding date last year. Residual stocks were about 2,000,000 bbl. greater.

Offers of No. 2 distillate at 9.5 cents a gallon are reported compared with a normal posting of 9.65 cents. Heavy fuel is available at $1.90 a barrel, off about $.10.

Despite colder weather in North Central states and very good movement of light fuels out of pipe-line terminals, kerosine and distillate prices remain under pressure because of the keen competition to move material before the end of the normal heating season.

CRUDE PRICES
GRAVITY SCHEDULE

	Signal Hill, Calif‡	Okla. homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.11	....	....	....
19-19.9	2.18	....	....	....
20-20.9	2.24	$2.25	....	$2.12
21-21.9	2.30	2.27	....	2.14
22-22.9	2.37	2.29	....	2.16
23-23.9	2.45	2.31	....	2.18
24-24.9	2.53	2.33	$2.56	2.20
25-25.9	2.61	2.35	2.58	2.22
26-26.9	2.69	2.37	2.60	2.24
27-27.9	2.76	2.39	2.62	2.26
28-28.9	2.83	2.41	2.64	2.28
29-29.9	2.91	2.43	2.66	2.30
30-30.9	2.97	2.45	2.68	2.32
31-31.9	3.04	2.47	2.70	2.34
32-32.9	3.12	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico.

Last general price change represented a 50-cent increase, effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.85
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.35
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.40
Southwest Pennsylvania	3.97
West Virginia	39.1
Illinois Basin	2.77

EQUIPMENT MEN . . . in the News

Hughes Tool Announces Three Major Promotions

L. L. PAYNE

Dr. Daniel J. Martin, vice president, engineering, Hughes Tool Co., has recently announced the promotion of Lyle L. Payne to assistant vice president, engineering. R. S. Grant has been appointed chief product engineer, in charge of the product-engineering department, succeeding Payne, and A. P. Farr has been appointed assistant chief product engineer.

R. S. GRANT

A. P. FARR

Payne graduated from Rice Institute in June 1930, and has been with the Hughes Tool Co. since 1929. Grant graduated from Rice Institute in June 1928, and has been in the engineering departments of the company since February 1928. Farr is a graduate of Oklahoma A. & M. College, and has been with Hughes since 1937.

Cooper-Bessemer Adds Evans to Houston Office

MORRIS EVANS

Appointment of Morris Evans to Cooper - Bessemer Corp.'s regional office at Houston has been announced by Stanley E. Johnson, vice president in charge of sales. Working under the direction of Robert Dale, branch manager, Evans will devote his efforts to engineering compressor installations for refinery operations.

A graduate of Vanderbilt University and Virginia Military Institute, Evans has received a degree of bachelor of engineering in mechanical engineering.

Baash-Ross California Division Holds Sales Meet

Under the direction of F. L. Tooley, executive vice president, and E. M. Gearke, general sales manager, the California division of Baash-Ross Tool Co., held its initial sales meeting of 1953 early in January at Los Angeles. Those attending the meeting included, left to right: Hal Messinger, sales representative; John Dickman, chief engineer; E. G. Streight, sales office supervisor; Tom Boyd, secretary and treasurer; F. O. Knoblock, Bakersfield, Calif., shop superintendent; G. R. Brown, Long Beach, shop superintendent; E. W. Carne, Ventura, Calif., sales representative; H. L. Richards, director of industrial relations; W. Y. Cadawallader, Bakersfield sales representative; Tooley; A. A. Hilliard, Long Beach sales representative; Roy Johnson, executive vice president of Republic Supply Co. (guest speaker); L. J. Laird, assistant sales manager, and Gearke.

Since graduation he has been undergoing intensive factory training at company plants in Mount Vernon, Ohio, and Grove City, Pa., with special attention to compressor operations in refinery work. For the present he will concentrate his field activities to southeastern sector of Texas.

Crane Appoints Schmitz Vice President of Sales

C. E SCHMITZ

Carl E. Schmitz has recently been appointed vice president in charge of sales for Crane Packing Co., Chicago. He formerly held the position of vice president and director of engineering.

In a reorganization of the sales department under Schmitz there will be five division sales managers: E. H. Stubenrauch, mechanical packings; Stephen Hawxhurst, molded Teflon products; Harry I. Sole, lapmaster; V. E. Vorhees, mechanical seals, and Stillman Segar, plastic lead seal.

Another appointment announced was that of A. J. Solari to the position of chief engineer, mechanical seal division.

Schmitz joined Crane in 1942, where his duties have been with the engineering department.

Perforating Guns Atlas Opens Dallas Sales Office

LEE BONE, JR.

Paul Charrin, president of Perforating Guns Atlas Corp., has announced the opening of the company's twenty-second office, at Dallas. This new sales office will be under the direction of Lee Bone, Jr., district sales manager. Bone was previously in charge of field operations for the company in Longview, Tex., where he served for 3 years.

Perforating Guns Atlas also recently opened new field stations at Mission, Abilene, Gainesville, and Beaumont, Tex. The company's 22 offices now provide oil-field services from 19 field stations 24 hours daily. Their services include bullet and jet shot perforating, simultaneous radiation and electrical well logging, side-wall coring, open-hole jet shot, and all Baker wire-line services.

According to J. H. Castel, executive vice president, the company's new 10-acre plant now under construction at Houston is progressing steadily. When completed this new plant will contain advanced scientific research facilities for developing well-completion equipment to serve the oil-field industry throughout this country and Canada.

Mid-Continent Supply Opens New Store at Liberal, Kans.

B. G. REMMERT

Ken W. Davis, president of Mid-Continent Supply Co., Fort Worth, has announced the erection and opening of a new store in Liberal, Kans. This store will serve as Mid-Continent headquarters for supplying the drilling industry in western Kansas, southwestern Colorado, the Texas Panhandle, and northwestern Oklahoma.

Davis has also announced the promotion of B. G. Remmert as store manager at Liberal. Remmert has been with Mid-Continent for 5 years, and served at the Great Bend and Plainville, Kans., stores before assuming duties as field salesman at Liberal.

R. F. Timmons and C. L. Washburn are field salesmen, and J. R. Miller, J. L. Wood, and J. L. McHenry are storemen at the Liberal store. The location is under the supervision of Great Bend district manager B. S. Harkrider. The store is in Mid-Continent's Kansas-Oklahoma Division, under the direction of assistant division manager A. T. Skaer, and division manager. S. R. Clinkscales.

Edward Valves Erects New Engineering Building

An attractive new two-story modern structure built almost entirely of stainless steel and glass has just been erected by Edward Valves, Inc., East Chicago, Ind. The new building was built for Edward's engineering department, and has been specially designed for its use. The location of this building, adjacent to Edward's research laboratories, was designed to make liaison between the two departments as simple and convenient as possible. This arrangement permits continual consultation between engineers working with specific design problems, and laboratory research scientists who study basic characteristics of various valve constructions and materials.

Thew Shovel Entertains Pipe Line Contractors

The Thew Shovel Co., Lorain, Ohio, entertained contractors at the annual Pipe Line Contractors convention at Houston last month. The party was held in the Grecian Room of the Shamrock Hotel just prior to the banquet. One group shown at the banquet are: J. T. Cushing, Thew Shovel Co.; S. D. Bechtel, Jr., S. D. Bechtel Corp., San Francisco; and G. E. Gunther and J. F. Beles, both with Thew Shovel.

A Lorain crawler hoe with extra long crawlers and other special features for pipe-line work was displayed at an outside exhibit during the Pipe-Line Contractors convention.

Brown Oil Tools, Inc., Names Feeser Research Engineer

John R. Feeser recently joined the staff of Brown Oil Tools, Inc., Houston, as a research engineer. He will be stationed in Midland, Tex.

Feeser was formerly employed by a major oil company in the West Texas area. During World War II he served with the Army Engineers on the construction and operation of the pipe line from Cherbourg, France, to Frankfort, Germany. He is a graduate of Texas Technological College at Lubbock.

Alten Foundry Opens Three New Warehouses

Warren M. Benson, vice president and sales manager, Alten Foundry & Machine Works, Inc., has announced the opening of three new warehouses, increasing the number of Alten field stocking branches to five. In making the announcement, Benson stated that this expansion was prompted by the success of the first field warehouse as an experiment in late 1951 at Wichita Falls, Tex.

Locations of the new branches are as follows: Casper, Wyo., will serve the supply-store trade in the states of Wyoming, Colorado, and Montana. Dean

L. Richardson is manager. Houston will serve southeastern Texas, Louisiana, and Mississippi. Henry H. Paris is in charge. Western Canada will be served by a company branch at Edmonton, Alta., with Jerrold A. Drexel as manager.

Broom Named to New McCullough Position

J. S. BROOM

J. Sidney Broom has been appointed fishing-tool service engineer at the McCullough Tool Co.'s Vernal, Utah, branch, according to an announcement by I. J. McCullough, president.

Broom has had over 26 years' experience as a driller, tool pusher, and superintendent with leading oil companies and drilling contractors in the Rocky Mountain, Mid-Continent, and California oil fields. During the past year he has been working out of the McCullough Los Angeles headquarters as a fishing-tool service engineer.

Kansas City Is Headquarters For Mine Safety Appliances

Industrial expansion throughout central and north central states has led Mine Safety Appliances Co., Pittsburgh, to establish headquarters and warehouse facilities in Kansas City, Mo., for a new nine-state sales district.

With six trained safety-sales engineers the new district includes Kansas, Missouri, Iowa, Nebraska, Minnesota, Wyoming, eastern Montana, and North and South Dakota.

C. H. Mehaffey, who has been with the company 17 years, has been named sales manager of the new district. Until his new appointment, Mehaffey was assistant manager of the industrial department of the company at Pittsburgh.

Lufkin Holds Annual Sales Conference

Lufkin Foundry & Machine Co.'s annual sales conference was held in Lufkin, Tex., January 5-8. Lufkin representatives cover all of the oil fields in the United States, Canada, South America, and its export office in New York City distributes Lufkin oil-field machinery to all parts of the world. In attendance at the conference were, first row: G. L. Vickrey, F. C. Hays, Elbert Butler, Glenn Henderson, W. W. Trout, L. A. Little, Guy Croom, Vernon Glenn, Louis Fincher. Second row: T. A. Banta, Harold Bowerman, Elvin Read, W. T. Crowder, Jr., Ben Sargent, Jr., Oliver McKay, Byron Robbins, and Billy Burnett. Third row: Bob Spaulding, E. P. Trout, Jack Gissler, Charles Dyer, Hubert Dyer, J. D. Bradley, J. T. Hood, Bob Miller, and Cooper Richards. Fourth row: G. W. Nichols, R. C. Thompson, Louis Breeden, Dan Martin, John Swanson, Ed Terrill, Val Gallia, and C. M. Wooten. Fifth row: H. H. Muller, D. A. Reid, Ernest Slaughter, John Metteauer, T. L. Bowers, T. D. Lashley, Fred Griffin, Bob Poland, Jack Reid, and Bill Miner.

Oilwell Names Promotions In California Area

Two appointments in the California area were recently announced by Donald S. Grubbs, area manager for U. S. Steel's Oil Well Supply division.

William A. Moore, manager of Oilwell's branch store at Avenal, Calif., for the past 5 years, was appointed district representative in the San Joaquin Valley district, and Paul S. Paulsen was named to succeed him as store manager at Avenal.

In his new position, Moore will serve the western part of the San Joaquin Valley. His headquarters will remain at Avenal. Moore had 5 years of oil-field experience prior to joining Oilwell at Avenal in June 1947.

Paulsen, with 7 years' prior experience in the trade, was employed by Oilwell in April 1951 as a field representative at Avenal, holding that position until his new appointment.

Hydro-Blast Announces Executive Appointments

Robert K. Strong, president of Hydro-Blast Corp., of Chicago, has announced the following appointments to the executive staff of the company; Herbert J. Niermann as vice president in charge of sales; P. C. Will as vice president in charge of engineering; W. F. Gamble as secretary-treasurer, and John W. Watson as chief production engineer.

Martin-Decker Sales Engineers Visit Plant

Martin-Decker sales engineers who recently visited the Long Beach plant to study newest product developments were, front row: Louis Webber, plant manager; Frank Crane, chief engineer; Frank Kelso, Odessa, Tex.; Jack Clements, Houston; M. Donovan, Oklahoma City. Back row: Roy Boydston, California; E. L. Decker, president; Carroll Kelso, Odessa, and T. J. Cullens, San Joaquin Valley.

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

CLASSIFIED ADVERTISING

UNDISPLAYED CLASSIFIED 20c a word one issue. 10% Discount three or more consecutive issues. $4.00 minimum charge. Blind Box in our care nine words. Payable in Advance.

DISPLAY CLASSIFIED
$14.00 a column inch one issue . . .
10% Discount three or more issues.

Address Classified Advertising Material: The Oil and Gas Journal, P. O. Box 1260, Tulsa 1, Okla.

EQUIPMENT FOR SALE

FOR SALE
D C 110-115 Volt Electric Motors, ½ to 10 H. P.—D C Generators with diesel drivers—D C Motor Starters and Magnetic Controls—D C Electric Bench Grinders—One Westinghouse Switchboard Panel. All in good working condition. Itemized list available. If interested contact: A. V. WINTHER, PASOTEX PIPE LINE COMPANY, P. O. BOX 1022, EL PASO, TEXAS.

FOR SALE: 40,000 ft. #1 3½" O.D. standard plain end line $0.55 per ft. 20,000 ft. 4" O.D. flues. Rogers Pipe and Supply Company, Phone 5-8850, Tulsa, Oklahoma.

TWIN BEECHCRAFT

D18-S License N-80163. A beautiful silver trimmed in red, Corporation operated, Executive plane, completely equipped for instrument flying, including lots of extras, Lear L-2 Automatic Pilot, 80 gal. nose tank. This airplane has been flown by one pilot only. A real clean airplane. Write or wire **Al Buchanan Drilling Co., 2114 Alamo National Bldg., San Antonio, Texas.**

FOR SALE

Drilling rig used less than 6 months. Lee C. Moore Mast, N-4 Brewster Draw Works w/Hydromatic Brake powered by WAKU Waukesha gas engine, 2 slush pumps 6x12 and 5x10, 6000 ft. 3½ inch Drill Pipe, Tool House and Tool Boxes, Auto and Winch Truck. Ready to go to work. Call Rex or B. F. Snowden, 4-4106-2-2736, Tyler, Texas, or write P. O. Box 993.

PRESSURE VESSELS
Immediately Available

NEW LOW PRICES

8—10' ID dia. x 40' x 3" shell. Heads 3⅛". Test Pressure 900 psi. WP 600#.
5—10' ID dia. x 40' x 2½" shell. Heads 3". Test Pressure 750 psi. WP 500 psi.
6—8' ID dia. x 40' x 2" shell. Heads 2¼". Test Pressure 750 psi. WP 500 psi.

All used, good condition, seam to seam, welded construction. Built by A. O. Smith Corp. Located near Chicago, Ill. Prints, prices available on request.

WIRE—PHONE—WRITE

KINSLOW POWER & EQUIPMENT CO.
817 So. Boulder, Tulsa, Okla.

1 OILWELL Steam Pump, 16¼ x 7¾ x 20". This pump is in excellent condition, may be seen at Makin Drilling Company Yard, Hobbs, New Mexico. Makin Drilling Company, Box 1628, Hobbs, New Mexico.

CASING FOR SALE: 6000'—6¼" ID—6⅝" OD, 13#, Byers Gen. Wrought Iron—T&C.—14 Thds. New, prime, 20' Lgths. JULIUS M. FOGELMAN, 1649 Perkiomen Ave., Reading, Penna.

LINE PIPE
20,000 ft., 4½", 10.79 lb., plain end, Lap Weld line, cleaned, straightened and beveled for welding. Priced for quick sale. Edco Pipe & Supply. Phones 4-5970 and 9-8434, Box 151, Tulsa.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

FOR SALE

Bucyrus-Erie Spudder, Model 24L, purchased new in October, 1951, complete with all tools, house, water pump, water tank, light plant, etc.
(also)
Cyclone Drilling Machine, Model 46, purchased new in 1947, trailer mounted with lines.

Phone or Write:

MR. W. B. ARMSTRONG
P. O. Box 284
Wooster, Ohio
Phone: 2353

HUMBLE TYPE

1¼" PRESSURE and TEMPERATURE RECORDERS
2½" DRILL - STEM PRESSURE RECORDERS
OIL FIELD RESERVOIR ANALYSIS EQUIPMENT

ENGINEERING PRODUCTS INC.
(Successors to Engineering Laboratories, Inc. BHP Division)
600 E. 4th St. Phone 2-7223
Tulsa 3, Oklahoma

WELL drilling equipment, new or used Spudders, rotaries, core & shot hole drills, tools, pipe, bits, blocks, pump jacks, valves. Everything for well drilling and service. Fishing tools rented. Pressey & Son, Pueblo, Colo.

FOR SALE: 2,500 ft. Rotary drilling rig with double section derrick, Cardwell draw works, 6¾ by 12 Gardner-Denver pump and other accessories. Phone Jackson 8-2897, or write Gene Graham Drilling Co., Box 5183, Okla. City.

ONE Cardwell "S" draw works with air clutches and WAKU Waukesha engine, 87' jackknife mast with 6' 6" substructure, 2 power slush pumps with engines. Wilson swabbing unit. QRC blowout preventers, 4" x 6" water pump. Rig complete with tools for workover and servicing. Stacked near Houston. $55,000.00. Norvell - Wilder Supply Company. Box 2178 Houston, Texas. Phone AT-3471.

FOR SALE

2—WAK Waukesha engines complete with clutches. These engines are completely rebuilt and guaranteed for 90 days. Each **$3750.00**

Call or write

ROY BULLS, Phone 3-8307
310-B West Eleventh, Amarillo, Texas

USED EQUIPMENT FOR SALE

1—4' x 6' x 30' Mogul substructure Manufactured by Wichita Engr. Co. Excellent condition **$1000.00**

7—Type LR 10" Series 900 Cameron Single Blowout preventer. Good condition **$400.00**

1—Set 2¼" x 72" B-J Weldless Elevator links **$250.00**

1—1942 GMC Water Truck with 2000 Gal. tank. Good rubber **$1000.00**

1—4' Lee C. Moore derrick—Crown extension. Good condition **$500.00**

Call or write

ROY BULLS, Phone 3-8307
310-B West Eleventh, Amarillo, Texas

FOR SALE AT HOUSTON

11700'	5½" x 15½#
9000'	5½" x 17#
4600'	7" x 23#

J-55, Range 2, Short T & C, New, Seamless, Tested 3000 psi, **IMPORTED** CASING.

BARON TUBE CO.
722 Oliver St., NW
Atlanta, Ga.
Phone: Atwood 9721

FOR SALE—ALL STEEL ROOF TANKS

2—80,000 bbl., 5—55,000 bbl., 1—25,000 bbl. and 10—10,000 bbl., 4—5,000 bbl., 22—1,250 bbl.

All cleaned out ready to cut down, located Wichita, Kansas, priced standing, cut down, or rebuilt your grade.

P.O. Box 1858 **W. C. BERRY** **Phone 3-6141, Tulsa, Okla.**

EQUIPMENT FOR SALE

FOR SALE: R. L. Dubbledrum Cardwell fully equipped. Oklahoma City, Oklahoma. Melrose 8-5108.

FOR SALE: 8—Shriver 42"x42" cast iron Filter Presses, Plate & Frame type, 18, 27, and 54 chambers, 1" cake; 15—Sperry 18"x18" cast iron Filter Presses, 11 chambers; 3—#12 Sweetland Filters for 36 leaves on 4" centers. Immediate shipment. Attractively priced. Consolidated Products Co., Inc., 17-20 Park Row, New York 38, N. Y. BArclay 7-0600.

1—BJ 200 ton 10¾" slip casing elevator with slips. 3—National 150 ton Ideal Swivels. 2—6" GS Swivels. 1 over and under National Crown Block. 4000' 6⅝" OD Drill Pipe with 7⅝" API regular tool joints. 1 set 23¾" x 98" BJ Weldless Links. E. A. Kelly, 1540 S. E. 29th Street, Box 861, Oklahoma City. Phone Jackson 5-6407.

NEW 2" PIPE

90,000'—2⅜" O.D., 3.25# Continuous Electric Weld Steel Pipe, 42' DRL, Plain End, all coated and wrapped. Pipe will be cold water tested 600# psi. Located Corinth, Miss. Price available on request.

MID-STATES PIPE & SUPPLY CO.
Ph. 2-9128, Tulsa, Okla.

STORAGE TANKS

1—25,000 bbl. (80' x 30')
3—30,000 bbl. (86' x 30')
1—35,000 bbl. (96' x 30')

Used, good condition, suitable for re-erection. Standing location near Neodesha, Kansas. Complete specs. available on request.

ROGERS & WRIGHT, INC.
216 W. 2nd St.
MID-STATES PIPE & SUPPLY CO.
65 N. Madison
TULSA, OKLA.

ABSORBERS FOR SALE

2—TULSA BOILER, 84" x 45', 16 Fixed Trays, 1 Double Mist Extractor, 120 psig. Test.

Each $5,100.00

LOCATION: Near Bishop, Texas

Southern Minerals Corporation

P. O. Box 716
Corpus Christi, Texas

EQUIPMENT FOR SALE

TWO FAILING 1500 heavy duty drills with 4½ x 6 pumps, automatic pulldown, and mounted on International trucks. Write P. O. Box 819, Longmont, Colorado. Phone 1333.

FOR SALE: Air compressors, one used 11x5x12 inch NCTB two stage Chicago Pneumatic, serial 27689, air compressor complete with 6 WAK engine. One used Ingersoll-Rand, type XOB Imperial compressor, 11x5x10 inch cylinders, complete with 145 Waukesha engine; also extra cylinders and other parts. Both above engines completely overhauled by Waukesha last two months. Both compressors in good condition. Price $5000.00 each. Located 17 miles southwest of Hebbronville, Texas, in Las Animas field. Chas. S. Sollars, owner, St. Anthony Hotel, San Antonio, Texas.

TWO Hydraulic Pipe Pulling machines, good condition. One mounted on Half-track, one on trailer. Ace Duncan, Telephone 2-1414, Tulsa, Oklahoma.

FOR SALE: 2—New B. J. Multiplex 6 x 8 x 10 pipe line pumps, 1000 Gal. @ 400 ft., maximum head 2000'. List $3468.00 each. Our Price $1250.00 each. Bender Oil Operations, P.O. Box 52, Bakersfield, California.

FOR SALE

Approximately 50 power cylinder heads for Worthington LTC compressors and 50 power cylinder heads for R.A. Series Clark compressors, used but in good condition; subject to inspection. Price: Worthington heads $55.00 ea., Clark heads $40.00 ea., f.o.b. shipping point. United Iron & Machine Works, 249 N. Port Ave., Corpus Christi, Texas, phone 4-5453.

FOR SALE in the Russell-Great Bend, Kansas Area approximately 150,000' of 2" water line buried 30-36" deep which will be available for reclaim during wheat harvest and wheat planting period. Cities Service Oil, Patridge, Bartlesville, Okla.

WORTHINGTON ENGINE

Model DDG, 450 HP, 360 RPM, 5 Cylinders, 4 cycle, 13¼" Bore x 17½" stroke. Under operation only 2 years. Rebuilt and guaranteed. Gas, Diesel or Dual. with or without Worthington Duplex Double Acting Pump, 3½"x18", 2,500# pressure, 72 strokes per min.

Above units in excellent condition.

MANUFACTURERS EQUIPMENT CO.
1878 E. 18th St., Cleveland, O.

24" LINE PIPE Available For Immediate Shipment

Gas Pipeline company has available for sale approximately 15 miles of 24" O.D. new .310" wall line pipe, API 5LX42, hydrostatically tested to 930# and inspected at mill by established Engineering Company.

Write Box G-334
The Oil and Gas Journal,
Tulsa, Oklahoma

EQUIPMENT FOR SALE

GAS METERS FOR SALE. Westcott, Foxboro and Emco. Good condition. Geo. R. Milner, Box 124, Okmulgee, Oklahoma.

FOR SALE: One Barrel Type Ethyl Lead Plant. Hutex Oil & Refining Company, P. O. Box 2146, Houston, Texas.

FOR SALE: Hydraulic pipe pulling equipment, 2 speed jacks, displacement pump, spiders, slips, etc. All mounted on 2 ton Dodge truck, all in first class condition and ready to work. Located at Artesia, New Mexico. A & B DRILLING COMPANY, Box 563, Artesia, New Mexico. Phone 1284.

SALES and rentals of cable drilling and fishing tools, casing and equipment, from the Southwest's largest stock of used cable tools and oil field supplies. Degen Pipe and Supply Co., Tulsa, Oklahoma.

FOR SALE: National Drilling Rig. Capacity 4,000 Feet. Good Condition. Buffalo Motor. Tools and Line not included. Wolf's Head Oil Refining Co., Inc., P.O. Box 137, Oil City, Pennsylvania.

87' Lee C. Moore Cantilever Derrick located East Central Oklahoma. Drilled one well since complete overhaul by Lee C. Moore. 4½' substructure, steel floor, 4' drop wings. $8,000.00. Box G-329, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Two Denver-Gardner 5 to 7¼ x 10, Figure FO-FXO, power pumps. Like new condition. $3500.00 each. J. A. Finlayson, 108 E. 4th St., Tyler, Texas. Phone 3-3563.

FOR SALE: Sullivan "300-A" drilling rig, complete with 2—Buda engines, one practically new, draw works, rotary table, 65' derrick with 20' section to pull doubles; Wheatley 7 x 10 mud pump, swivel, traveling block, kelly, etc. All mounted on tandem trailer. Excellent rig for drilling to 3000' or deep core drilling. Rig in excellent condition. Price less drill pipe $24,000.00. Contact Box 1022 or Phone 813, Del Rio, Texas, for inventory.

JOY 300 Drilling Rig butane powered, mounted on Brockway 6x6 truck. 3500 feet 3½ inch drill pipe. Auxiliary mud pump and butane engine as separate unit. All tools and equipment included. This rig in first-class working condition and can be seen working now. Call or write Steele Brothers, Crete, Nebraska. Phone 127.

FOR SALE: 1600' 5½", 17#, lapweld casing. Long couplings, good threads, good body. $1.50. Also 4, 6, 8" casing. M. J. Regan, Coffeyville, Kans.

FOR SALE: 6000' 4½" OD Sonoscoped Drill Pipe, 4500' 3½" Reg. Drill Pipe. Rotary & Cable Tool Equipment. Giffin & Thompson Supply, Phone 477, Hoisington, Kansas.

COUPLINGS For Sale: 5,000 8⅝" O.D. Recessed Couplings, off of 28.55# pipe; priced $1.50 each; 2000 10¾" O.D. off of 41# pipe, recessed; 2500 12¾" O.D. recessed; all of the above 8V thread. All couplings cleaned and in first-class condition. A. A. Gilbert Pipe & Supply Co., P. O. Box 986, Shreveport, La.

EQUIPMENT WANTED

WILL PAY highest prices for used casing, used line pipe, abandoned leases, or other surplus lease equipment. Your idle producing equipment is worth dollars. Green Pipe & Supply Co., Box 1383, Tulsa, Oklahoma.

WANTED: Three engine compound for Wilson Titan drawworks. Makin Drilling Company, Box 1628, Phone 3-3141, Hobbs New Mexico.

INTERESTED IN 1500 ft. 3½ inch external upset drill pipe, prefer 20 ft. lengths, fitted with tool joints; Byron Jackson breakout tongs; light weight rotary table with 12 in. opening; Mission slips; latch type elevators; drill hose; light duty draw works or rig; and other rotary accessories. Air mail complete list price and shipping point. Heater Well Co., Box 1128, Raleigh, N. C.

WANTED: One Thrible Jack-knife and substructure. No Junk Wanted. Makin Drilling Company, Phone 3-3141, Hobbs, New Mexico.

WORTHINGTON HIGH PRESSURE PUMP

3 x 12 HORIZONTAL Duplex Plunger Double ACTING POWER PUMP Type KUF 106 GPM at 2200 PSI DISCHARGE PRESSURE

New 1938. Used very little—Will Sell With or Without Direct Coupled GE 100 hp 495 RPM 220V Slipring Motor and Magnetic Controller.

ACME EQUIPMENT CO., INC.

126 S. Clinton St., Chicago, Ill., Phone Andover 3-3430

HELP WANTED

FOREIGN EMPLOYMENT. List of oil companies and drilling contractors showing where to apply for foreign jobs. OIML Co., Box 2603, Tulsa, Okla. $5.00 cash.

SEISMIC PERSONNEL needed for United States and Canada by well known and expanding contract geophysical company. Address Box E-863, The Oil and Gas Journal, Tulsa, Oklahoma.

DIVISION Geologist with Louisiana Gulf Coast regional subsurface experience required by sound, substantial company in New Orleans. In reply, please state salary expected and give details of education and experience. Replies confidential. Box G-313, The Oil and Gas Journal, Tulsa Oklahoma.

GEOLOGIST wanted to headquarter in Denver with independent oil company. Must have well sitting, sample examination and mapping experience, and at least two years experience in Rocky Mountain Area. Reply will be kept confidential. Box G-264, The Oil and Gas Journal, Tulsa, Oklahoma.

SUPERINTENDENT

NATURAL GAS DEPARTMENT

An Opportunity to Start on the Ground Floor

THE SASKATCHEWAN POWER CORPORATION

a provincial crown corporation distributing electric power to over 600 cities, towns, villages and hamlets in Saskatchewan, requires a superintendent for its Natural Gas Department to assist in setting up a provincial gas utility.

EXPERIENCE IN ACTUAL OPERATION OF COLLECTION, TRANSMISSION AND DISTRIBUTION SYSTEMS, WITH PARTICULAR REFERENCE TO RATES AND CUSTOMER ACQUISITION AND RELATIONS IMPORTANT.

Excellent superannuation plan, sick leave with pay and other fringe benefits. Salary $5,000 to $8,000 per year commensurate with experience and responsibility. Apply to:

J. W. Tomlinson, General Manager,
Saskatchewan Power Corporation,
1739 Cornwall Street,
Regina, Saskatchewan.

HELP WANTED

PETROLEUM Engineers, graduates, minimum three years field experience, one year contract, foreign work. Prefer single men experienced in drilling operations and mud control. In replying give education, experience, and salary expected. Address Box G-298, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Industry Employment Service, 405 Tuloma Bldg., Tulsa, Okla. 4-5974. Tom Robinson, owner. For Technical and Trained Personnel, including LPG.

GEOLOGIST with Canadian or Rocky Mountain experience wanted by independent oil company to headquarter in Calgary. Replies will be kept confidential. Box G-265, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Process engineer familiar with all types of refinery operations including asphalt, coking and cat cracking. Location—Rocky Mountain Area. Box G-323, The Oil and Gas Journal, Tulsa, Oklahoma.

REGISTERED professional engineers experienced in evaluation oil and gas properties by major oil company headquarters Tulsa. State experience and qualifications. Box 521, Tulsa, Oklahoma.

ASSISTANT CHIEF ENGINEER

Age 30-45. Graduate and registered engineer. Experienced in gas pipe line design and construction. Office in Houston. Mail reply giving qualifications.

Box G-292, The Oil and Gas Journal,
Tulsa, Oklahoma

MAKE YOUR CAREER A RESEARCHER AND TEACHER IN PETROLEUM SCIENCES

On September 1, 1953, two persons will be added to the regular staff of the School of Petroleum Engineering, University of Oklahoma. One position is for a junior member of the faculty who has received a Ph.D. or Sc.D. in Petroleum, Chemical, Mechanical Engineering or a Ph.D. in Chemistry or Physics. The person selected for this position will teach undergraduate and graduate courses and direct some research.

The second position is for a senior member who has a Ph.D. or Sc.D. degree and two or more years of experience in petroleum production or related work. The person selected for this position will direct the research program of the School of Petroleum Engineering as well as teach a few advanced courses.

The basis of selection of a person for each position will be on over-all qualifications. Faculty members are permitted to do some consulting work and they are urged to participate in remunerative research through the University of Oklahoma Research Institute.

For additional information and application forms write to:

Prof. H. W. Benischek, Chairman
School of Petroleum Engineering
The University of Oklahoma
Norman, Oklahoma

WELDING ENGINEER - INSPECTOR

A qualified applicant should:

a) have both theoretical and practical knowledge of welding, including experience with welding of alloy steels and aluminum.
b) know inert-gas welding and equipment.
c) have a thorough knowledge pertaining to the welding of API and ASME code vessels and pressure piping codes.
d) have shop fabrication inspection experience.
e) have experience in training and qualifying code welders.

Excellent salary, advancement and security. Travel is required. Outstanding opportunity with leading, progressive and expanding firm of engineers-constructors in petro-chem field with domestic and international activities.

Interviews arranged in New York at our expense. Arrangements for relocation of immediate families of selected applicants to NYC area.

Qualified applicants send complete detailed chronological resume, including salary history to Personnel Department:

HYDROCARBON RESEARCH, INC.
115 Broadway, New York 6, N. Y.

HELP WANTED

PETROLEUM Engineer familiar with South Louisiana completions. Geological experience. Headquarter at Fort Worth, Texas Crude Co., Fort Worth.

PROFESSOR or Instructor in Petroleum Engineering: To teach upperclass and graduate courses in mechanical and operational methods in petroleum production, drilling, transportation, etc. Should have MS degree as petroleum, mechanical, or other qualified engineer, plus field experience. Appointments permanent. Contract for 12 months rather than academic year. Salary open. Applicants write to Division of Petroleum and Natural Gas Engineering, The Pennsylvania State College, Pa.

MECHANICAL ENGINEER for design and or field installation of gas process equip. At least 2 years exp. in plant process or construction. Leading S. W. Manufacturer. Box G-279, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

LANDMAN trainee (have some experience) or office assistant, with independent. MA degree Economics. Business law, statistics. Own car. Any hours any place. $350 monthly. Trial basis fine. Reply Box G-307, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, 7 years major company experience, Gulf Coast and West Texas, production, drilling, and reservoir analysis. Employed, married, age 31. Desires position with independent. Box G-309, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 1628, Ph. No. 3-3141, Hobbs, New Mexico.

PETROLEUM GEOLOGIST, four years subsurface, surface, 34, married, desires employment with independent oil company. Box G-322, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY Engineer—Experienced in design, construction and maintenance supervision of fluid and Thermofor crackers, pipe stills and product treating. Age 29. Desire relocation midwest. Box G-248, The Oil and Gas Journal, Tulsa, Oklahoma.

DIVISION Geologist with Louisiana Gulf experience desires responsible position in New Orleans. Regional subsurface and good varied exploration experience. Box G-336, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, 3½ years experience. Presently employed as Drilling Engineer. Age 32. Available late spring. Resume on request. Box G-333, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN with 16 years of Major Company experience desires connection with small independent or individual. Can furnish the best of references. Box G-331, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, ten years' experience with major oil company, desires responsible position with independent operator. Box G-325, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST. Graduate Oklahoma University, 2 years' experience, age 31, married. Box G-328, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION FOR SALE

PRODUCTION FOR SALE: West Virginia all or fraction part paying $400.00 month 1/32. Call Dr. Walter Price, 3-6213, or write 2281/2 Capitol Street, Charleston, West Virginia.

PRODUCTION WANTED

WANT producing wells in paraffin or heavy oil areas where heating bottom hole fluids with Parelex Electric Heater could increase production. Parelex Corporation, Box 552, Houston 1, Texas.

LEASE AND DRILLING BLOCKS

WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2153, Denver, Colorado.

LEASE FOR SALE. 260 acres in Ashland County, Ohio, with 28 producing Oil & Gas Wells. Berea Sand—510 ft. Deep. Only a small portion developed, more acreage is available. For further information write, P. O. Box #188, Chippewa Lake, Ohio.

I OFFER oil and gas leases in Pecos County, also mineral rights. For complete details write to John Stouppas, 175 E. Long St., Columbus, Ohio.

DRILLING Deals. See A. L. Bowles, Rollow Bldg., Ada, Okla.

FOR SALE: 320 acre state oil and gas lease in Lea County, New Mexico. Box G-320, The Oil and Gas Journal, Tulsa, Oklahoma.

HAVE you drilled on the best looking structures and missed? If so, then let me stake you a location on your leases or farm out some of mine to you. Box G-317, The Oil and Gas Journal, Tulsa, Oklahoma.

AM offering 2000 acres of mineral rights perpetual full participating under 50 quarter sections scattered in Northwestern Kansas Counties. Will sell all or one-half at $10.00 an acre. Address 409 Commercial Bank Bldg., Muskogee, Oklahoma.

WILL TRADE wheat land located in Colorado for drilling equipment. Write, Phone 875, or wire. Geo. L. Aycock, Jr., Guymon, Oklahoma.

NEWTON COUNTY, TEXAS—2440 acres of leases interspersed through Amerada Oil Company's 55,000 acre lease spread. Reasonably priced. Plat of area furnished free on request. Box G-324, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES—Drilling Deals—Producing and Non-Producing Overriding Royalties—Texas Gulf Coast Area. Inquiries invited. Box G-326, The Oil and Gas Journal, Tulsa, Oklahoma.

COULD use oil lease with offset production, or with small production but needs to be drilled completely. Newlun Royalty Company, Box 1324, Denver.

DRILLING DEALS WANTED

We will buy production, overrides, and producing royalties

Write **Phone 875** **Wire**

GEO. L. AYCOCK, JR.
Guymon, Oklahoma

LEASES ROYALTIES
Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited
B. D. BUCKLEY
6635 Delmar Ave., St. Louis 5, Mo.

For development of three serpentine plugs discovered by competent geophysical surveyors on our 2800 acre prospect in Southwest Texas want partner (silent or active) with
$250,000

Excellent chance for investment in longlasting and prolific production.

Write: DRAWER 791
Seguin, Texas

ROYALTIES

PRODUCING ROYALTY and overrides for sale. Wire-write-call for particulars. JACK EAGLE, 706 City Natl. Bldg., Okla. City, Okla. REgent 6-7027.

OIL ROYALTIES
Will sell some of my Weld County, Colo., personally owned perpetual royalties under close in leases. G. J. Stumpff, Irvine Eng. Co., 117 N. 2nd. Ave., Phoenix, Ariz.

QUICK CASH: Producing royalties, Overrides or Production . . . no delay. Phone 72-4533, Robert L. Kinkaid . . . P.O. Box 26, Tulsa, Oklahoma.

OVERRIDE ROYALTY
SOUTHEAST NEW MEXICO
Located up against well to drill offset to shut in well, which showed for production in 2 oil sands above 3200 ft. Complete data on request to Oil Men & Investors who can evaluate great potential worth.
W. J. PETERMAN, GEOLOGIST
Portales **New Mexico**

ROYALTIES WANTED
Producing Royalties
High Grade Only
Send Full Particulars
Address
C. C. HARMON
719 World Bldg., Tulsa, Okla.
P.O. Box 2151

SERVICES

WELL LOCATIONS & Land Surveys. Henry George White, Reg. Engr. #734 Court House Phone 427, Home 857, Chickasha, Oklahoma.

RANCHES AND FARM LANDS

FOR SALE: JACKSON HOLE, WYOMING, CATTLE & GUEST RANCH. Combination purebred cattle and guest ranch. Magnificent scenic setting. Three miles of large river through ranch. Good fishing and elk hunting. 1000 fertile acres highly developed. Will carry 200 cows and produce all feed year round. Two modern residences, all guest cabins luxury modern. Will sell equipped, furnished and stocked. Pictures, full information to responsible persons. Box G-297, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGISTS

GET MORE for our Oklahoma oil properties with a geological sales report. Box G-335, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS OPPORTUNITIES

FOR SALE

Franchises on a new high-speed drilling machine for drilling oil wells deeper and faster. Will drill oil wells and prospect holes in the most economical way.
A PERCENTAGE OF OIL to franchise holders for promoting drilling demonstrations with this drilling machine.
ROYALTIES, OVERRIDES POSSIBILITIES in oils, uranium, gold, etc., and other minerals.

REMAINING FRANCHISE DISTRICTS FOR SALE

No. 2—Montana, Idaho, Wyoming.
No. 3—Nevada, Utah, Arizona.
No. 5—North Dakota, South Dakota, Minnesota.
No. 6—Nebraska, Kansas, Iowa, Missouri.
No. 7—Texas, Oklahoma.
No. 8—Louisiana, Arkansas, Mississippi.
No. 10—Michigan, Wisconsin.
No. 12—Ohio, Pennsylvania, West Virginia, Virginia.
No. 13—New York, New Jersey, Delaware, Maryland.
No. 14—Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire.
No. 15—Alaska.

BASIC PATENT ON DRILLING MACHINE
Box G-332, The Oil and Gas Journal, Tulsa, Oklahoma

GEOPHYSICAL SERVICE

WOULD like to hear from firm interested in geophysical oil field exploration to do research work on method using Ultrasonic waves for determination of accumulation limits. Box G-327, The Oil and Gas Journal, Tulsa, Oklahoma.

Sawyer, Wallace Appointed Regional Sales Managers

Two new appointments as regional sales manager have been announced by R. G. Cole, general sales manager,

H. C. SAWYER

L. E. WALLACE

Orbit Valve Co. H. C. Sawyer has been transferred to Midland, Tex., as regional sales manager of a division consisting of North Texas, West Texas, New Mexico, and an area extending into the Rocky Mountains. L. E. Wallace has been appointed regional sales manager of the Gulf Coast, Southwest Texas, East Texas, Louisiana, and Mississippi.

Sawyer joined Orbit Valve in June 1945. He served in several areas prior to being transferred to Tulsa from Wichita Falls in August 1947. In 1949 he was named Mid-Continent district manager in Tulsa, which position he held until his recent appointment.

Wallace joined the company in February 1946 as a field representative with headquarters at Newark, Ohio. He was transferred from Newark to Corpus Christi, Tex., in October 1948; he was made a district manager in March 1952, and transferred to Houston in that capacity in October 1952.

McCutcheon Is Named Valve Division Sales Manager

James R. McCutcheon, Jr., has been appointed sales manager of the valve division of Homestead Valve Manufacturing Co.

McCutcheon received his early sales training with National Tube Co., and among industrial distributors of the Pittsburgh area. For the past 7 years he has served as district representative for American Car & Foundry Co.'s valve division in Western Pennsylvania, Ohio, Kentucky, and West Virginia. He will make his headquarters at Homestead Valve's main plant in Coraopolis, Pa.

ADVERTISERS IN THIS ISSUE

Acme Oil Tool Company 226
Alloy Steel Products Co., Inc. 227
Allen Foundry & Machine Works 241
Aluminum Co. of America 56, 191
American Car and Foundry Company 99
American Cyanamid Company 10
American Iron & Machine Works Co. 8
American Manufacturing Co. of Texas 4
Ansul Chemical Co. 198, 244
Armco Drainage & Metal Products, Inc. 130
Armstrong Machine Works 202
Autocar Company, The 51
Avondale Marine Ways, Inc. 38
Axelson Manufacturing Company 153

Babcock & Wilcox Company, Tubular Products Division 60
Baker Oil Tools, Inc. 114
Barco Manufacturing Company 109
Barnes Company, W. M. 160
Bell Rubber Company 250
Bethlehem Steel Co. 14
Bristol Company, The 100
Brown & Root, Inc. 132
Byron Jackson Co. Front Cover, 109

Cameron Iron Works, Inc. Inside Back Cover
Cardwell Mfg. Co., Inc. 176, 177
Carter Company, Inc., S. C. 84
Cast Iron Pipe Research Association, The 191
Chain Belt Co. 78
Chapman Valve Mfg. Co., The 96
Chicago Bridge & Iron Company 129
Chicago Metal Hose Division Flexonics Corporation 48
Clark Bros. Co., Division of Dresser Operations, Inc. 58, 59
Classified Advertising 259, 260, 261, 262
Cleveland Trencher Company, The 213
Cleveland Worm and Gear Company, The 28
Continental Motors Corp. 50
Core Laboratories, Inc. 15
C-O-Two Fire Equipment Company 98
Crose Manufacturing Co., Inc., M. J. 208
Crutcher-Rolfs-Cummings, Inc. 220
Cuiler-Hammer, Inc. 55

Davis Regulator Co. 223
Dean Brothers Pumps, Inc. 223
Dean Hill Pump Company 23
Delta Engineering Sales Co. 229
Denison Engineering Co., The 248
De Zurik Shower Co. 187
Dowell Incorporated 116
Dresser Industries, Inc. 179, 180, 181, 182
Drilling & Service, Inc. 249
Drilling Specialties Co. 232
du Pont 3, 103
Durabla Manufacturing Company 24

Elliott Company 92
Empire Trust Company 235
Ensign Carburetor Company 101
Fairbanks, Morse & Co. 2
Fisher Governor Company 43
Foster Wheeler Corp. 87, 88
Four Wheel Drive Auto Co., The 68
Frontier Chemical Company 187
Fuller Company 45

Gardner-Denver Company 63
Garrett Oil Tools, Inc. 185
Gaso Pump & Burner, Inc. 69
General American Transportation Corporation 147
General Descaling Co., Ltd. 221
General Electric Co., Electronic Dept. 82, 83
Geological Well Service Company 250
Geophysical Service, Inc. 236
Goodall Rubber Company 167
Goodyear Tire & Rubber Company 9
Gordon Co., Claud S. 230
Grancell, I. H. 243
Graver Tank & Mfg. Co., Inc. 85
Grinnell Company, Inc. 7
Griscom-Russell Co., The 94
Grove Regulator Co. 72
Guiberson Corporation 175
H & M Pipe Beveling Machine Co. 216
Halliburton Oil Well Cementing Co. 13, 102
Happy Company, The 209
Harnischfeger Corp. 144, 165
Harrisburg Steel Corporation 196

Helicoid Gage Division, American Chain & Cable Co. 166
Hercules Tool Company 192
Houston Contracting Company 218
Huey & Co., S. E. 218
Hughes Tool Co. Back Cover
Hydril Company 204
Independent Exploration Co. 22
Inferno Co., The 224, 250
Ingersoll-Rand 31
International Harvester Co. 20, 148
International Nickel Company, Inc., The 71

Jacobson, E. C. 218
Johnston & Jennings Company, The, Division of Petitbone Mulliken Corporation 169
Jones & Laughlin Steel Corporation, Supply Division 16

Kellie Products, Inc. 6
Kemp Mfg. Co., C. M. 18
Kennametal Inc. 219
Kidde & Company, Inc., Walter 80
Kinzbach Tool Co., The 235
Klein & Sons, Mathias 198
Kiemp Metal Grating Corporation 47
Kobe, Inc. 180, 181
Koch Engineering Company, Inc., The 228
Koppers Company, Inc. 93
Kraloy Plastic Pipe Co. 155
Ladish Co. 19
Landis Machine Co., The 11
Lane-Wells Company 30
Larkin Packer Company, Inc. 171
Le Roi Company 66, 67
Lonergan Co., J. E. 222
Lufkin Foundry & Machine Co. 29
Lunkenheimer Co., The 52
Magnet Cove Barium Corp. 179
Manhattan Rubber Division, Raybestos-Manhattan, Inc. 73
Marsh Instrument Co. 27
Martin-Decker Corp. 97
Martin Manufacturer, John N. 246
Mathieson Chemical Company 17
Maxim Silencer Company 217
Mayo Hotel, The 222
McCord Corporation 222
McKissick Products Corporation 240
Mercoid Corp., The 190
Metal Goods Corporation 28
Midwest Piping & Supply Co., Inc. 42
Minneapolis-Honeywell Regulator Co., Industrial Division 40, 41
Minneapolis-Moline 76
Nash Engineering Co. 37
National Airoil Burner Co., The 230
National Tube Company 36
Nicolet Industries, Inc. 216
Nordberg Mfg. Co. 61
Nordstrom Valve Division, Rockwell Manufacturing Company 105, 106

Oil and Gas Journal, The 206
Oil Center Tool Co. 44, 45
Okadee Company 210
Oklahoma Pipe Line Constructors 223
Otis Pressure Control, Inc. 154
Paris Distributor, Inc., Henry H. 227
Parker Appliance Company, The 112
Parkersburg Rig & Reel Co. 64
Peerless Mfg. Co. 136
Perrault Corporation 163
Petroleum Distributing Co. 226
Philadelphia Gear Works, Inc. 65
Philco Corporation 12
Pipelife, Inc. 212
Pipeline Anode Corp. 237
Procon Incorporated 32, 33
Pyrene Manufacturing Company 107
Radio Corporation of America 110
Raybestos-Manhattan, Inc., Manhattan Rubber Division 73
Raybestos-Manhattan, Inc., Packing Div. 214
Reed Roller Bit Company 159
Refinery Supply Co., The 202
Robbins & Myers, Inc. 168
Rolo Manufacturing Co. 198
Rosson-Richards Company, The 218
Royal Bank of Canada 239
Rust-Oleum Corporation 21
Sawyer-Jensen-Ross Co. 211
Schlumberger Well Surveying Corp. 247
Security Engineering Co., Inc. 182
Shaffer Tool Works 225
Sherman Products, Inc. 195
Sivalls Tanks, Inc. 245
Skinner Company, M. B. 77
Smith Corporation, A. O. 37, 200
Spicer Mfg., Div. of Dana Corp. 53, 54
Standco Brake Lining Co. 226
Steel Forgings, Inc. 222

Stoody Co. 193
Superior Combustion Industries, Inc. 111
Technical Oil Tool Corp., Ltd. 157
Tellex Incorporated 206
Templeton, Kenly & Co. 224
Thermoid Company 25
Thomas Flexible Coupling Co. 238
Thompson Tank & Manufacturing Co., Inc. 4 187
Thornhill-Craver Co. 95
Timken Roller Bearing Company, Steel & Tube Division 81
Torrington Company, The 79
Tretolite Company 34
Unit Rig & Equipment Co. Inside Front Cover
U. S. Steel Corp. Subsidiaries 36
United Supply & Manufacturing Co. 188
Universal Oil Products Co. 150, 151
Victaulic Co. of America 104
Victor Products Corp. 230
Vogt Machine Co., Henry 89
Wagner Electric Corporation 62
Walker Co., W. L. 211
Wallace & Tiernan Products, Inc. 223
Walworth Co. 8
Warner Lewis Company 211
Washington Iron Works 192
Watson-Stillman Fittings Division H. K. Porter Company, Inc. 140
Western Supply Company 215
Westinghouse Electric Corp. 74, 75
White-Roth Machine Corporation 178
Wickes Boiler Co., The 242
Williamson, Inc., T. D. 284
Wilson Manufacturing Co., Inc. 90, 91
Wilson Supply Co. 95
Winpower Mfg. Co. 221
W-K-M Company, Inc. 59
Worthington Corporation 46
Wyatt Metal & Boiler Works 70
Young Radiator Company 86

Rocky Mountain Area

(Continued from page 250)

Weld County: Continental Oil Co. 1 Percy Perry, C SW NW 13-9n-61w, dry, TD 7,552 ft. "M" sand 7,450 ft.

COLORADO SUCCESSFUL WILDCAT

Weld County: Twin Oil Co. 2 Cuykendall, NW NW SW 12-2n-63w, pumped 288 bbl. of oil per day from the "J" sand 7,021 ft., TD 7,046 ft.

NEBRASKA SUCCESSFUL WILDCAT

Kimball County: Forest Oil Corp. 1 Marcum, NW NW NW 27-13n-55w, pumped 27 bbl. of oil per day from "D" sand 6,234 ft., TD 6,560 ft.

NEBRASKA WILDCAT FAILURES

Cheyenne County: Plains Exploration Co. 1 Brauer, NE NE SE 4-12n-49w, dry, TD 4,850 ft. "O" sand 4,838 ft.

Derby Oil Co. 1 Hiett, NE NE SW 13-12n-52w, dry, TD 5,254 ft., Skull Creek 5,236 ft.

Dawes County: Gulf Oil Corp. 1 Royal, NE SW SW 23-30n-51w, dry, TD 3,958 ft. Second Sundance 3,835 ft.

Scottsbluff County: Colling Oil Co. 1 Baxter, C SE NW 14-22n-54w, dry, TD 6,809 ft. "M" sand 4,764 ft.

LEGAL

Sealed bids will be received at the office of the Area Director, Bureau of Indian Affairs, Room 305, Federal Building, Albuquerque, New Mexico, until 2:00 o'clock, P.M., M.S.T., March 17, 1953, and then publicly opened for sale of oil and gas leases on 15 tracts of Jicarilla Tribal Indian lands, totaling 38,672.46 acres, more or less, located in the Rio Arriba County of New Mexico on the Jicarilla Indian Reservation. Each tract containing four sections each, is offered for lease separately. For complete description of the land, location, provisions and stipulations of the leases to be sold, address the Superintendent Jicarilla Indian Agency, Dulce, New Mexico.

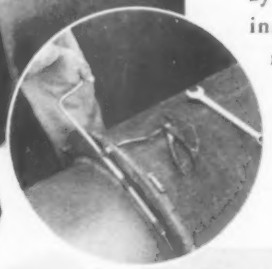
A tested and proven design for efficient pipeline protection. . . . More than 18,000 crossings equipped since 1950. . . .

Williamson
CONCENTRIC-SUPPORT INSULATORS

Provide low-cost, dependable protection for right-of-way crossings . . . Simple to install with a common wrench . . . Impervious to pipe coatings . . . Support blocks center pipe in casing, spacer blocks provide clearance through casing . . Available for all combinations of pipe and casing diameters.

TYPE "L" WmSEAL CASING BUSHINGS

Provide a water-tight seal even under the worst conditions of out-of-round casing . . . Unaffected by dirt, moisture or backfill during or after installation (no dope, adhesive or shield required) . . . Electrical insulation of pipe from casing provides economical cathodic protection.



Easily installed with common hand tools.

Write for Bulletin 249-A

T. D. Williamson, Inc.

THE PIG WITH THE POKE
CLEANS PIPE LINES

P. O. BOX 4038
TULSA 9, OKLAHOMA

REPRESENTATIVES

CANADIAN EQUIPMENT SALES & SERVICE CO., LTD.
EDMONTON, CALGARY, TORONTO, CANADA

LANGLEY Y CIA.
BUENOS AIRES, ARGENTINA

KERR ENGINEERED SALES CO.
PIGS & TAPPING MACHINES
PITTSBURGH 22, PENNSYLVANIA

H. E. DAVIS
LOS ANGELES, CALIF.

STUART STEEL PROTECTION CORP.
BUSHINGS & INSULATORS
KENILWORTH, N. J.

BEN W. BRUNDAGE COMPANY
OAKLAND 11, CALIFORNIA

JAMES S. KONE CO.
AMARILLO, TEXAS

HAMMOND IRON WORKS
KEYES TANK DIVISION
CASPER, WYOMING
PROVO, UTAH

Set 'em and forget 'em

The valve that seals tightly, operates easily, and requires the least maintenance and attention deserves top priority. That's the Cameron Non-Lubricated Lift Plug Valve.

It seals tightly because of a novel mechanical design which employs a seat separate from the body which is, therefore, not affected by pressure forces and line strains. It operates easily because of the lift-turn-reseat principle which eliminates friction between the plug and seat. It requires minimum maintenance because it does not depend on lubricant to effect a seal or for easy operation. And being non-lubricated, it also eliminates the possibility of contaminating line products.

that's the beauty of

Cameron NON-LUBRICATED LIFT-PLUG VALVES

Cameron
IRON WORKS, INC.

C.I.W., INC., P. O. Box 1212, Houston, Texas
EXPORT: 7912 Empire State Bldg.
New York, N. Y.

SELLING THROUGH SUPPLY STORES

Here's why you don't replace tool joints when they are Hughes Flash-Weld

**Drill stems are deliberately failed in the Hughes Laboratory in evaluating field performance of pipe-to-tool-joint connections. Pioneered by Hughes, these tests simulate conditions that cause drill stems to fail in the field.*

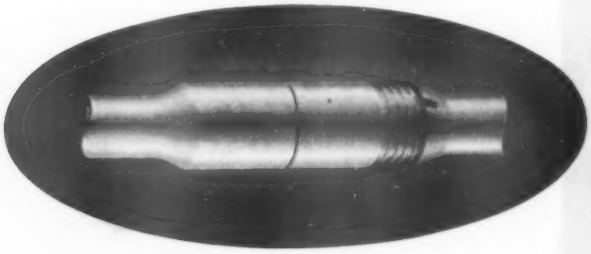
1 HUGHES Flash-Weld Joints are made to last the life of your drill stem . . . eliminating costly tool joint replacements.

2 HUGHES hard-faced Flash-Weld Tool Joints withstand the wear of abrasive formations—and can be *safely* rehard-faced in the field to meet extreme abrasive conditions.

3 HUGHES Flash-Weld Joints have been proved on more than 25,000,000 feet of drill pipe and by 15 years of superior field service.*

4 HUGHES Flash-Weld drill stem is the most dependable drill stem you can run in your well.

5 Cost records show that the cost per foot of hole drilled is lower with HUGHES Flash-Weld drill stem.



FLASH-WELD
A DEVELOPMENT
OF
HUGHES
TOOL COMPANY
HOUSTON, TEXAS